88th YEAR

AMERICAN GAS JOURNAL

SEPTEMBER 1945

FROM THE ALCHEMIST'S CRUCIBLE

A wild spirit

Did Burst Forth

esearch men in the 16th century were nown as alchemists. One such, named John aptist Van Helmont, made a startling dis-overy. In his own words, he found that a eated crucible "did belch forth a wild spirit r breath." Thoroughly frightened, when he aw or felt the presence of this spirit, it was atural for him to refer to it as a *geest*, which anslated means *ghost*. Many feel that the nglish contraction of this word became gas. Van Helmont's ghost no longer repels. amed and controlled, gas has become a ommercial and household necessity. From is and other early beginnings a great in-ustry has sprung.

Today, the modern counterpart of the chemist delves into research that will further e progress of the gas industry. Today, as ways, EMCO research and initiative will ep EMCO Meters and Regulators in step ith the increasingly exacting demands for easurement and control of this vital fuel.

Partners for progress

GAS THE CLEAN, CONVENIENT, ECONOMICAL FUEL

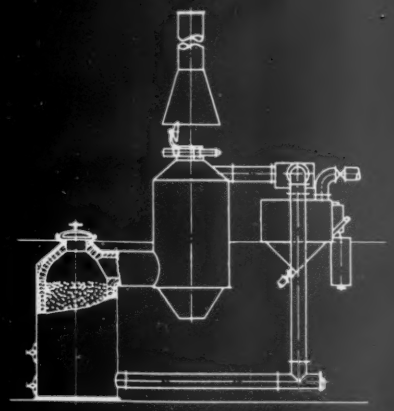
EQUIPMENT FOR GAS MEASUREMENT AND CONTROL

Pittsburgh Equitable Meter Company

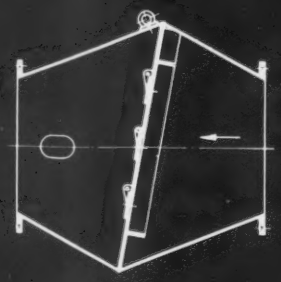
. . . . . Pittsburgh 8, Pa.

EMCO

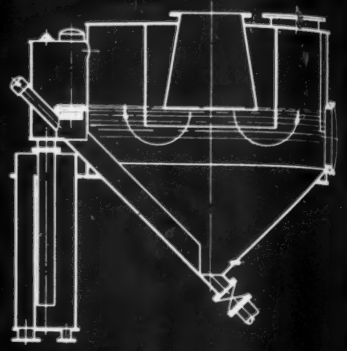
BEST GAS DOES IT BETTER



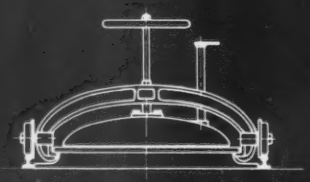
BLUE GAS MACHINE



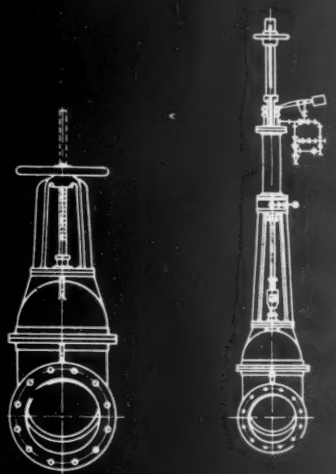
CHECK VALVE



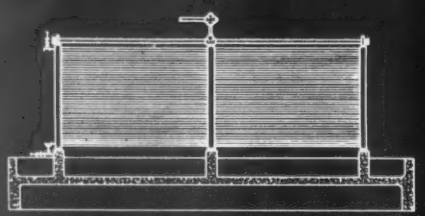
HYDRAULIC SEAL
OR
WASH BOX



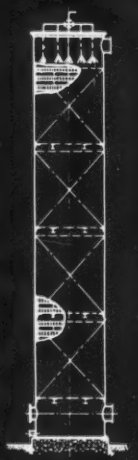
CHARGING DOOR



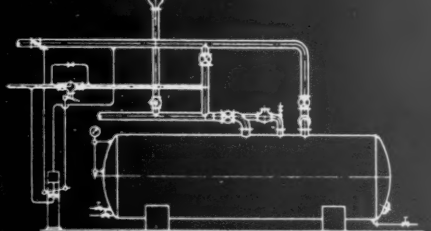
HAND OPER. HYDR. OPER.
GATE VALVES



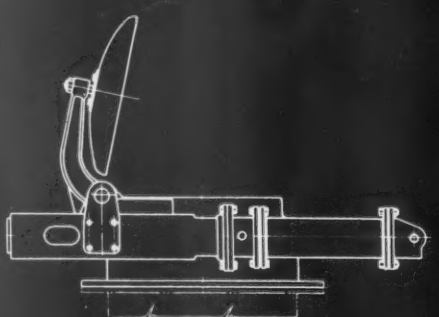
COOLING COIL



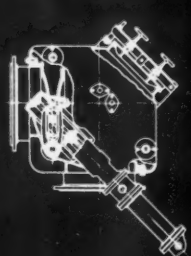
GAS SCRUBBER



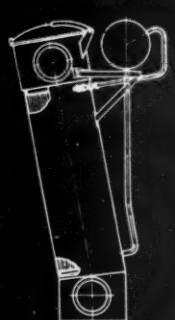
STEAM ACCUMULATOR



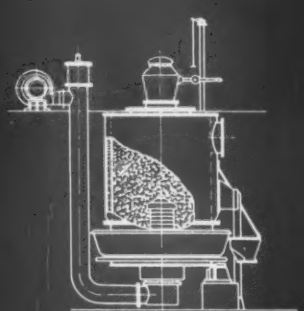
HYDRAULIC OPER.
STACK VALVE



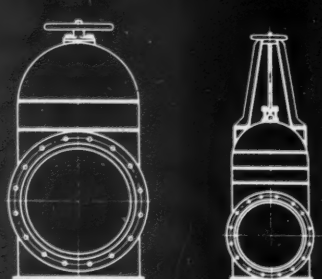
HYDRAULIC OPER.
REVERSING VALVE



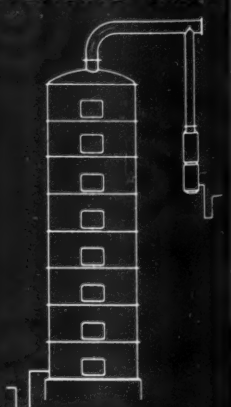
WASTE HEAT BOILER



GAS PRODUCER



BLAST GATES

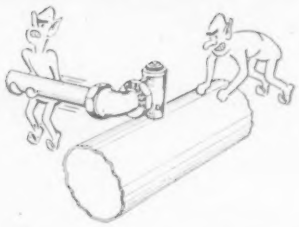


DISTILLATION
EQUIPMENT

SEMET-SOLVAY ENGINEERING CORP
40 RECTOR STREET

Build in "Give and Take"

at service connections with Dresser Style 90 SUPER-SERVICE Fittings to assure long, trouble-free service



Frost, spring thaws, traffic shocks . . . all these impose stresses on gas mains, particularly at service entrances. The ability of Dresser SUPER-SERVICE entrance fittings to absorb these stresses reduces trouble at these points . . . reduces maintenance and increases life. Protect vital service connections by building into them the flexibility of Dressers. A few types of service connections are illustrated at the right.

Dresser fittings "give and take" on pipe movements because of their unusual flexibility. Up to 6 degrees, and more, of deflection and up to $\frac{3}{8}$" movement longitudinally are normal. Joints stay "bottle-tight" for life.

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Bradford, Pa.
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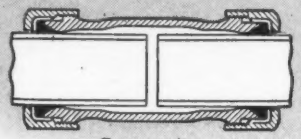
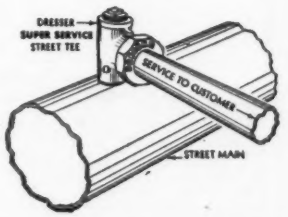
Dresser Style 90 SUPER-SERVICE FITTINGS ...available in all standard sizes and shapes



Cross-section, standard couplings

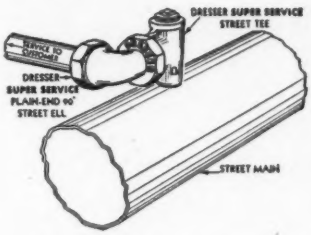
Flexible—but Tight: End nuts compress resilient gaskets between fitting body and pipe . . . permitting the utmost deflection and movement without breaking the seal. No threads in pipe mean no loss of wall thickness. Rugged steel construction withstands the most severe service.

How to Make Service Connections with Style 90 Fittings



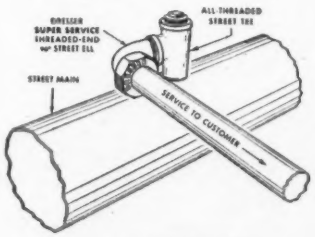
STREET TEE

Dresser Street Tee used alone at main where slight degree of pitch on long service makes a swing joint unnecessary. Such pitch is easily "made" in flexible Dresser branch. Rugged, easy to join.



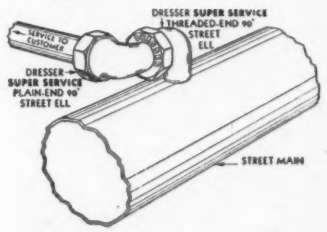
SWING JOINT

Dresser Street Tee and Dresser Plain-end 90° Street Ell make up a completely flexible, adjustable, swing joint that does not "freeze". Especially desirable on services having sharp pitch or subject to considerable movement.



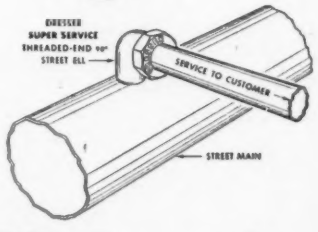
SWING JOINT

Dresser Threaded-end 90° Street Ell combines with screwed street tee (or screwed street ell), on both renewals and new services, to introduce flexibility and ease of joining at service end of "swing".


DRESSER SUPER SERVICE THREADED-END 90° STREET ELL
SERVICE TO CUSTOMER
DRESSER SUPER SERVICE PLAIN-END 90° STREET ELL
STREET MAIN

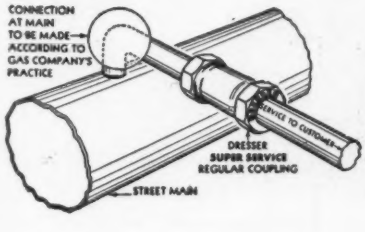
ANOTHER SWING JOINT

Dresser Threaded-end 90° Street Ell and Dresser Plain-end 90° Street Ell form another type of all-flexible swing joint, amply adjustable to line up with service. Fully "drawn up" and tight, no matter in which direction Ell may "look".



ELL ALONE AT MAIN

Dresser Threaded-end 90° Street Ell may be used alone where an ell instead of a tee is satisfactory. Flexible, like all Dresser SUPER-SERVICE Fittings. Assures easy joining and freedom from thread failure.


CONNECTION AT MAIN TO BE MADE ACCORDING TO GAS COMPANY'S PRACTICE
SERVICE TO CUSTOMER
DRESSER SUPER SERVICE REGULAR COUPLING
STREET MAIN

IN SERVICE LINE

Dresser Regular (5" body) or Long (10" body) Coupling, installed near main (or throughout service where several pipe lengths are used), completely absorbs movements of service or main.

DRESSER FITTINGS for Small Piping

ONE OF THE DRESSER INDUSTRIES

It's here . . .

Paint socket, spigot and gasket with soapy water.

Slip gasket into position, making sure it is evenly seated in the socket.

THE *Standardized* MECHANICAL JOINT

A standardized mechanical joint, incorporating the best features of the bottle-tight mechanical joints hitherto made in various designs by our members, is now available for cast iron pipe in diameters up to 12-inches. Larger sizes will be available later.

Besides the general benefits inherent in standardization, particularly in time of war, this new service offers these specific advantages:

- All parts are interchangeable no matter who supplies the joint.
- No need to stock different kinds of glands, gaskets and bolts.
- No delays on the job through delivery of wrong parts.

Ease, simplicity and speed of installation—always important advantages of mechanical joint cast iron pipe—will be still further enhanced as experience accumulates in working with one standard design.

All members of Cast Iron Pipe Research Association are now prepared to furnish the Standardized Mechanical Joint, with interchangeable parts, in sizes up to 12-inches. Cast Iron Pipe Research Association, Thomas F. Wolfe, Research Engineer, Peoples Gas Bldg., Chicago 3, Illinois.

With gland in position, insert bolts and tighten partially with fingers.

Take ordinary ratchet wrench (only tool needed), tighten up bolts alternately (bottom bolt, then top bolt, and so on). That's all!

CAST IRON

Standardized **MECHANICAL JOINT**

PIPE

A Great Magazine Idea

goes to work to sell the modernity of gas

HOMEMAKER'S DIGEST
Outstanding Articles of Household Interest, Condensed from LEADING HOME AND WOMEN'S MAGAZINES
★
OCT., 1945
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Place Your Order for Copies TODAY!

Homemaker's Digest will be made available to Gas Companies with Home Service and/or Kitchen Planning Departments at the cost of mailing and printing—approximately 3¢ per copy. The magazine will be published quarterly, starting October 15. It will be 6½ by 9 inches, twenty-four pages, profusely illustrated, and printed with alternate pages in full color and two colors.

HOMEMAKER'S DIGEST

developed and published by Servel ... will be distributed exclusively by Gas Companies to their customers

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When a commercial magazine publisher heard about *Homemaker's Digest*, he wanted the idea for his own use. But Servel refused. No copies of *Homemaker's Digest* will appear on the newsstands. No copies will be sold except to Gas Companies for cooperative mailing to their meter lists. *Homemaker's Digest* is exclusively a Gas Industry and Gas Company promotion.

One million copies of the first quarterly issue of *Homemaker's Digest* will be printed, and available for mailing in October. Print orders for subsequent issues will be increased to meet demand. Among the leading home and women's magazines whose material will appear in the pages of *Homemaker's Digest* are: *Good Housekeeping, Woman's Home Companion, Better Homes & Gardens, McCall's, Woman's Day, American Home, House & Garden, Parents' Magazine* and *House Beautiful.* Working hand in hand with the editors of these publications, the editors of *Homemaker's Digest* will choose the best current features on kitchen planning, kitchen convenience, cooking, food preparation and care, household short cuts and allied subjects.

Never before has any industry had such an interest-provoking promotion available for its sole use. Never before have the writings of recognized authorities in the homemaking field been prepared in a form for exclusive service to a single customer group. *Homemaker's Digest* will afford Gas Companies a unique and potent opportunity to extend customer service and win the wholehearted enthusiasm of housewives for Gas and Gas Service.

Servel, Inc.

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This fine Roper gas range is looking at millions of prospective range buyers ... looking at them right now from the pages of America's leading home magazines.

Those prospects are looking right back, too ... and being delightfully impressed by what greets the eye. For here they find a range they've been waiting for a long, long time ... a range graciously combining practical beauty with performance features that "ring the bell".

Ask the man who sold Roper gas ranges yesterday, is selling them today and will sell a lot of them tomorrow. He will tell you about the outstanding acceptance which Roper enjoys among housewives everywhere.

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GAS RANGES

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They would have been METERS —in 1940!

. . . BUT TODAY—they're waterproof cartridge storage cases and other equipment essential for complete victory.

During the time that our production skills and plant capacity have been absorbed largely in the manufacture of war materials, the Gas and Petroleum Industries have contributed in no small measure to war production success by postponing the purchase of all but the most vitally needed gas meters and other instruments.

During this period we've spared no effort to meet all essential meter requirements. From strategically-located plants, we're making short haul deliveries of meters and repairs—thereby saving manpower, conserving fuel and reducing transportation. The imminent release of manpower and materials will enable us to accelerate these meter deliveries.

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AMERICAN GAS JOURNAL

SEPTEMBER 1945

VOLUME 163 No. 3

Natural Gas Regulation In Texas

By

Hon. Olin Culberson

Chairman, Texas Railroad Commission

Hon. Olin Culberson

LEGISLATION has enabled the Texas Railroad Commission to end an intolerable and profligate waste of natural gas which was formerly taking place in the State, and thus add to both the life and volume of Texas gas reserves. The more obvious forms of waste consequently have been eradicated, but efforts toward gas proration, which is designed to curtail subtle types of waste occurring within the reservoirs through the premature encroachment and coning of water, have thus far met with substantial reverses.

The information and knowledge obtained from the establishment of oil proration has not proved of much assistance in the proration of gas because of the inherent differences between these two underground resources. Devices which are expedient in the proration of oil do not apply in the proration of gas and therefore, it has been necessary to start from the beginning.

The specific statutes under which the Commission operates state that they were enacted *for the protection of public and private interests* against the evils of the production and use of natural gas under wasteful conditions by prohibiting such waste and by compelling ratable production.

The statutory definition of a gas well is any well which (1) produces natural gas not associated or blended with crude oil at the time of its production, or (2) any well which produces with a gas-oil ratio in excess of 100,000 cubic feet per barrel of crude oil produced. An oil well is defined in this statute as any well which produces one or more barrels of crude per 100,000 cubic feet of natural gas.

Dry gas is defined as any natural gas produced from a stratum that does not produce crude petroleum oil. Sour gas is defined as natural gas that contains in excess of 1½ grains of hydrogen sulphide per 100 cubic feet, or gas that contains in excess of 30 grains of total sulphur per 100 cubic feet of gas, or gas which in its natural state is found by the Railroad Commission to be unfit for domestic light and fuel purposes.

Casinghead gas is defined as gas indigenous to an oil stratum and produced incident to oil production from such stratum. Sweet gas is all natural gas that does not fall in the casinghead gas and sour gas classification.

The law states that the production, transportation or use of any of the types of gas in such manner, in such amounts or under such conditions as to create waste is unlawful and prohibited. Our legislature considered to be wasteful practice in the production, transportation or use of natural gas, the following:

(1) The operation of an oil well with an inefficient gas-oil ratio.

(2) The drowning with water of any stratum capable of producing gas in paying quantities.

(3) Permitting natural gas to burn wastefully.

(4) The creation of unnecessary fire hazards.

(5) Loss incident to or resulting from so drilling, equipping, or operating wells in such manner as to reduce the ultimate recovery of natural gas from a reservoir.

(6) The venting to the air from a well producing both oil and gas of any quantity of gas in excess of that amount necessary in the efficient operation of the well.

(7) Production in excess of transportation or marketing facilities.

(8) The use of natural gas for carbon black manufacture without first extracting the natural gasoline content.

(9) The use of sweet gas produced from a gas well for carbon black manufacture.

(10) Permitting any natural gas produced from a gas well to escape to the air.

(11) The production of natural gas from a well producing oil from a stratum other than that in which the oil is found unless such gas is produced in a separate string of pipe from that in which the oil is produced.

In addition to the definitions of the different kinds of gas as heretofore mentioned and what constitutes waste in the production and handling thereof, Texas law has something to say concerning for what purposes these different kinds of gas shall be used. Texas law provides in part that after the expiration of ten days from the time of encountering gas in a gas well no gas from that well shall be permitted to escape to the air and no gas produced therefrom shall be utilized except for these purposes:

Sweet Gas

(1) Light or fuel.

(2) Efficient chemical manufacturing other than the manufacture of carbon black.

(3) The introduction to an oil or gas bearing horizon to maintain or increase the reservoir pressure and increase the ultimate recovery therefrom.

(4) The use for the extraction of natural gasoline from the gas when the resulting residue is returned to the formation from which it came.

Sour Gas

(1) Efficient chemical manufacturing processes including the manufacture of carbon black, provided. when used for carbon black manufacture, that the plant recovery must be as much as one pound of carbon black per 1,000 feet of gas and provided the gas is stripped for its gasoline content prior to burning it for such purposes.

Casinghead Gas

(1) May be used for any beneficial purpose.

Sweet, sour, and casinghead gas are permitted for gas lift where the gas so used does not exceed 10,000 cubic feet per barrel of oil produced.

Provision is also made for the semi-annual determination of open-flow and rock pressures of each gas well. These determinations to be made under uniform and generally recognized methods and regulations prescribed by the Commission.

Texas statutes have this in general to say with respect to permitted rates of production from gas wells:

(1) Nothing contained in the statute shall require that the production from any gas well having a daily natural open-flow of 200,000 cubic feet or more be less than 50,000 cubic feet daily, and further that nothing in the statute shall require that the production from any gas well having a daily natural open-flow of less than 200,000 cubic feet be reduced to a quantity less than 25% of the open-flow volume.

(2) In all common reservoirs producing both sweet and sour gas, no gas well shall be permitted to produce in excess of 25% of its daily capacity; provided the Commission, upon finding that reservoir conditions require that such percentage be increased to prevent waste and that such increase will not create a drainage condition as between sweet and sour gas areas, may authorize an increase in such allowable production.

Operating under the statutes previously referred to, the Commission has done these things with respect to regulating the production of gas in Texas:

(1) It has promulgated a general rule of statewide application which rule applies in the absence of a specific rule. This general rule limits the daily take from gas wells to a quantity not to exceed 25% of its open-flow potential capacity.

(2) With respect to the production of casinghead gas it has also promulgated a statewide rule which applies in the absence of a specific field rule, which statewide rule sets up a permissible gas-oil ratio of 2,000 cubic feet per barrel. If the production of such quantity of gas per barrel of oil is deemed to result in an inefficient use of gas, then after notice and hearing it may prescribe a permissible gas-oil ratio which testimony shows will result in the efficient utilization of gas to produce the oil. In some fields this permitted ratio is as low as 500 cubic feet per barrel, whereas in other fields it may exceed 2,000 cubic feet per barrel.

(3) Another way that the Commission has sought to obtain the greatest utilization of the gas contained in a reservoir that is productive of both gas and oil is to allow the closing in of the wells that produce with ratios in excess of that prescribed by the Commission and to permit the transferring to and producing by other wells of the allowable of such closed in wells, provided that the transferred oil must be produced from wells that operate with gas-oil ratios lower than the operating ratio of the wells from which the oil is transferred.

(4) The Commission has always advocated and encouraged the picking up casinghead gas from oil wells and returning it to the producing formation where such is necessary for reservoir pressure maintenance and where such practice can be shown to result in a greater ultimate recovery of oil and gas from the reservoir. We have many applications of such nature and seldom does a week pass but that we have a hearing on some such application.

Proration

With respect to reservoirs that are productive of gas only, it might be well to point out that the most of these reservoirs in Texas, so far as potential capacity is concerned, lie along the Gulf Coast area and in what we refer to as the Panhandle District of Texas. For several years the Commission has been prorating natural gas in the Panhandle Field, which is one of the largest gas reserves in the nation. Gas proration schedules are prepared monthly for the purpose of allocating among the various wells their proportionate part of the gas outlet assigned the field. Other gas fields on which proration schedules are issued are the Rodessa Field, the Carthage Field, and several reservoirs in the Agua Dulce Field.

Another conservation measure which the Commission has been putting into effect in an effort to make the most efficient use of gas in a reservoir that contains both gas and oil is to place a volumetric displacement on the gas wells. Such a rule is designed to permit any gas well to void as much space in the reservoir daily as does an oil well producing from the same reservoir. It does not deny the rights of the operator that is situated in the gas cap area, but simply restricts his production to a reasonable amount primarily for the purpose of preventing an undue rise in the gas-oil contact and the migration of oil from the oil column into the dry gas sand.

Recent Orders

I would specifically call attention to some of the more recent orders of the Commission that have been promulgated to apply to strictly gas reservoirs. The first of such orders promulgated by the Commission to my knowledge applies to the Lake Creek Field in Montgomery County, Texas. In this field we have eight separate known gas sands in the interval from approximately 8900 feet to 11,600 feet. At hearings held before the Commission evidence was adduced to show that the gas contained in these gas reservoirs is extremely rich and that at least three of these reservoirs are of such extent

and nature that it is feasible and practical to carry on a pressure maintenance program at the same time that gas is being produced. It was shown that ordinary separator usage resulted in the recovery of some 160 barrels of condensates per million cubic feet of gas produced, whereas by processing this gas in an absorption plant there could be recovered an additional plus 100 barrels of condensate per million feet. It was further shown that the dew point in the reservoir was at or near virgin reservoir pressure and that any reduction of this reservoir pressure resulted in the heavier constituents of the gas coming out of the gaseous phase in the reservoir and assuming a liquid phase therein, and that under such conditions it is very improbable that the maximum recovery from the reservoir can be obtained unless the reservoir pressures are maintained at such a point so that these hydrocarbons will be kept in a gaseous phase in the reservoir.

It developed with respect to the reservoirs in this particular field that there was slight evidence of an effective water-drive and that therefore, if reservoir pressures were to be maintained that the most practical means of maintaining them would be to return the gas to the reservoir as soon as it has been processed for its hydrocarbon content. This particular order to which reference is made does not prohibit any operator from making any use of his gas production which is permitted by statute. The order simply provides that reservoir pressures shall be maintained at such a point as to result in the efficient recovery of the natural resources constituted of the hydrocarbons contained in these reservoirs to the end that the least amount of these hydrocarbons will be left in the ground never to be recovered.

Orders similar to this order have been promulgated with respect to various gas reservoirs in the Agua Dulce Field.

We think these orders make provision for the highest degree of conservation that can be practiced in any gas reservoir. They are landmark orders in the field of gas conservation in Texas.

With respect to orders of the Commission concerning fixing of efficient gas-oil ratio limits within which oil wells may be produced, it would be well to point out that as early as 1937-38 the Commission instituted periodic gas-oil ratio surveys in the various fields where gas was a problem. In the application of these rules a gas well that produces with a ratio in excess of that prescribed by the Commission has its oil allowable reduced; the effect being that the high ratio well is allowed to produce as much gas from the reservoir in the production of its oil allowable as does a like well producing with a ratio within the limits prescribed by the Commission. In many fields our surveys were formerly quarterly or semi-annually, since the war emergency most of our periodic surveys are on an annual basis. The effect of such a rule is two-fold in nature.

First, it makes the operator conscious of gas when he is completing his well and makes toward a better well completion.

Second, it has the effect of promoting work-over operations where wells were originally so completed that the casing was set high and resulted in a penalty to the oil allowable.

Another type order which the Commission has entered with the purpose of encouraging the return of gas to the producing formation in oil and gas producing reservoirs provides that credit against the producing gas-oil ratio may be given for gas that is currently injected to the same formation from which it is produced. The application of such an order encourages injecting gas to the producing formation, since if there results therefrom a producing ratio in excess of that prescribed by the Commission the operator may secure credit against this gas withdrawn for the gas that he has injected. This type of order does not penalize the operator in his oil allowable if he injects a sufficient amount of gas to offset that which he has produced.

Summary of Practices

To summarize the preceding regulatory practices of the State of Texas, I further wish to give the following since these conservation practices have been prescribed by the Railroad Commission of Texas and found that they will conserve the natural gas in both oil and gas reservoirs and will prevent a waste of a great quantity of oil and condensate:

(1) Shut in high gas-oil ratio wells and transfer their allowables to other wells producing with lower ratios. It is believed that this measure is equally adaptable in water drive fields with gas caps and in gas drive fields. In the first case conservation is effected by preventing or reducing the movement of oil into the dry gas cap with consequent loss of recoverable oil. In the second case conservation is effected through a more efficient use of the only available source of reservoir energy.

(2) Keep permissible ratio limits as low as possible. This reduces the amount of gas produced both by curtailing the oil production of wells producing with high ratios and by encouraging proper completion and remedial practices on the part of the operators to escape ratio penalties.

(3) Encourage return of gas to oil reservoirs when an increase in ultimate recovery will be effected thereby. This is done through the device of net ratio penalty (difference between gas produced and gas returned) and through transfer of the allowable of injection wells to other wells on the lease.

(4) Do not permit the venting of gas from gas wells. In Texas a gas well is defined as one having a ratio in excess of 100,000 cubic feet per barrel and the venting of gas from such wells is prohibited by a statute. Some have thought that this limit is too high, but this objection can be met if high ratio wells are effectively penalized. This has not been true in the past, but through the amendment of Statewide Rule No. 6 it is now being accomplished.

(5) Restrict withdrawals from gas cap gas wells in oil reservoirs, even though this gas is used for light and fuel purposes. This is accomplished by the "volumetric withdrawal rule" which restricts the withdrawal of such a gas well to that of oil wells in the same reservoir.

(6) Restrict venting of gas in recycling plants. This has been accomplished through the Commission Order which prohibits venting in excess of 2 per cent of the through-put.

(7) Restrict net withdrawals from condensate fields even when the gas withdrawal is used for light and fuel purposes to the point where excessive retrograde condensation will not take place.

(8) Restrict jetting ratios. A statewide limitation of 10,000/1 is currently in effect, but it is believed that this limit is too high in most cases and it is considered unwise to exceed this limit except in extreme cases. In many fields excessive jetting ratios result in the waste not only of natural gas, but also of the reservoir energy through excessive water withdrawals.

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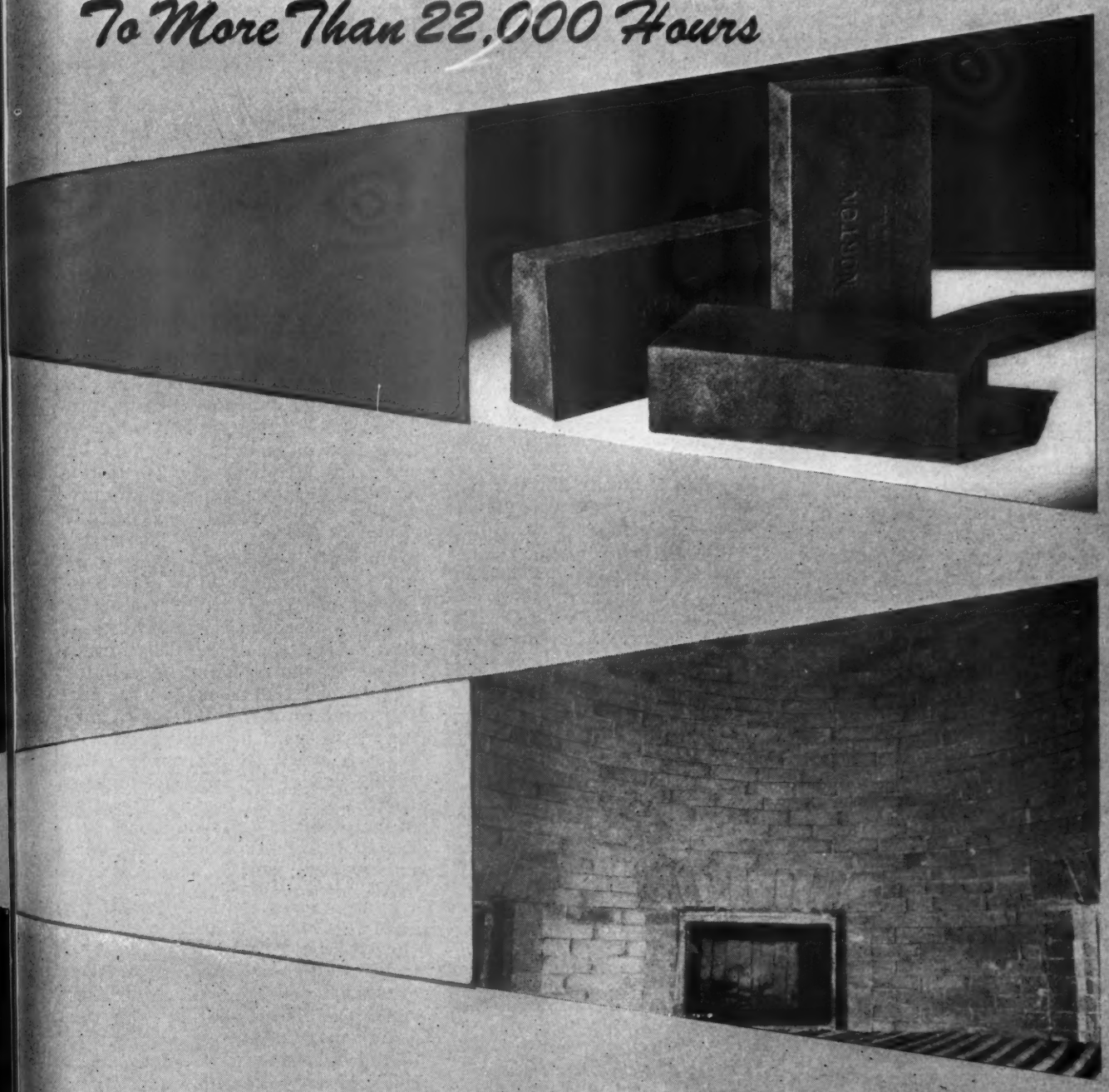

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The Complete Gasification of Coal: Thermal Considerations

By
Dr. J. G. King

IN this lecture I propose to describe briefly certain of the outstanding processes of complete gasification, and more particularly to examine those considerations which affect thermal efficiency.

The overall thermal efficiency of a process is the percentage which the thermal value of the products bears to the sum of the thermal values of the raw materials used and of the heat and power consumed. This is by no means the whole story, however, and careful study of the heat of the reactions involved in the process and of the distribution of sensible and potential heat in the plant and in the reaction products is the best means of determining where heat may be escaping unnecessarily from the system.

Producer Gas

The simplest machine for complete gasification, which is well known to you, is the gas producer, and a few considerations of the thermal quantities involved in the making of producer gas can serve as the most simple example. In its early form, producer gas was made by burning the carbon in the fuel, mainly to carbon monoxide. Assuming that it is possible to convert all the oxygen in the air to carbon monoxide, the maximum efficiency possible (coal to gas) is 70.1 per cent, the gas containing 34.7 per cent of carbon monoxide:

(i) $2\ C + O_2 + 3.76\ N_2 = 2CO + 3.76\ N_2 + 103{,}530$ B.Th.U.

The heat liberated appears as sensible heat in the hot gases or as radiation, etc., from the producer walls. In practice however, some carbon dioxide is formed, and it is interesting to calculate that the first 1 per cent of carbon dioxide in the gas means a reduction of thermal efficiency of 3.4 per cent.

In a thermally efficient system, therefore, one must attempt:

1. To keep the carbon dioxide to a minimum.
2. To reduce the radiation, etc., losses by lagging.
3. To return the sensible heat in the hot gases to the system, for example by preheating the air.

This simple form of producer is, however, thermally unstable, since the temperature of the fuel bed rises, and the normal form of gas producer is therefore operated with a steam/air mixture, the absorption of heat by the reaction:

(ii) $C + H_2O = CO + H_2 - 70{,}900$ B.Th.U.

balancing the exothermicity of reaction (i) to give a condition of thermal equilibrium.

The steam is usually introduced by blowing the producer with a blast of air saturated with water at a given temperature. If we imagine a system in which there is no heat loss and reactions (i) and (ii) only are realized, the molecular ratio O_2/H_2O is about 0.68 (saturation temperature 64° C.), and the producer gas would have the composition, CO, 39.8 per cent; H_2, 17 per cent; N_2, 43.2 per cent; and a calorific value of 182 B.Th.U. This means a thermal efficiency of 100 per cent, and in practice the efficiency realized falls short of this because of the heat carried away in the hot gases and dissipated from the producer and in the ashes. A producer is thus operated with a lower saturation temperature and a higher O_2/H_2O ratio, more of the order of 1.8 (S.T., 48° C.). In addition, the gas reactions reach equilibria with a proportion of CO_2 in the final gas, which causes a further decrease in efficiency.

The application of the results of thermal studies on a producer, therefore, follows the lines of:

1. Reducing external losses by radiation.
2. Maintaining a low O_2H_2O ratio.
3. Recovering heat from the hot gases and returning it to the producer.

The first can be done by lagging, but other considerations may postulate a jacket boiler to produce the steam required. The second can best be achieved by superheating the steam/air blast. Theoretically, the best result would be obtained by superheating the blast to the temperature at which the producer gas leaves, the heat of reaction of the CO_2 formed balancing the radiation and other losses. A recent patent (1) has protected this proposal, that when producers are used in conjunction with furnace work, the furnace gases should provide this necessary preheat. Alternatively, pre-heaters operating in the producer gas main would be a step in the right direction. The third improvement can be achieved in a variety of ways.

Water Gas

The second example can be taken from the production of carburetted water gas from coke, i.e., one step nearer to complete gasification. In this process there are many more complications than with producer gas, and it is more illuminating to study not only the overall thermal balance, but also how the heats of reaction are balanced within the process. Only in this way is it possible to appreciate fully where heat is being dissipated and further thermal economies may be made.

In this balance the steam used (11 units) is more than raised from waste heat, and only the surplus (3 units) appears in the balance. The modern carburetted water gas plant is one which has been very carefully balanced from the thermal point of view, so that one would not expect to find in the thermal balance of Table I scope for improvement of any magni-

In the March 3rd, 1945 issue of Gas Times, London, was printed a lecture by Dr. J. G. King, Director, Gas Research Board, on "The Complete Gasification of Coal—Thermal Considerations." Dr. King discusses the various gasification processes in detail. Believing this data will be of special interest to the manufactured gas industry here, we reprint the article in full. Ed.

TABLE I

PRODUCTION OF CARBURETTED WATER GAS FROM COKE AND OIL

	Heat Units		*Heat Units*	*Heat Units*
Coke	70	*Carburetted Water Gas*		
Oil	30	Potential Heat		64.5
Steam	(11)	Sensible Heat (730° C.)		5.2
	100	Undecomposed Steam		1.0
		Blow Gas	21.1	
		Used in Cracking	4.0	4.0
		Steam to Generator	9.8	
		Waste Gases (270° C.)	7.3	7.3
		Jacket Boiler	4.1	
		Steam to Generator	1.1	
		Extra Steam	3.0	3.0
		Tar: Potential Heat		5.0
		Clinker and Ashes		3.6
		Radiation		2.0
				95.6

Fuel Bed	*Heat Units*	*Heat Units*
Reaction between coke and steam	— 8.3	+15.3
Reaction between coke and air	— 2.2	
Sensible heat in blue water gas	— 0.9	
Sensible heat in steam	— 0.4	
Evaporation of water in coke	— 4.1	
Heat to generator jacket	— 0.6	
Sensible heat in clinker and ashes		+ 1.2
Back-run steam	—16.5	+16.5

tude. We can, nevertheless, find some. (2) In order to produce the 15.3 units required to balance the endothermicity of the steam reactions, the air reactions liberate 36.4 units, of which 15.3 are stored in the generator and 7.3 are eventually lost in the waste gases.

Liberation of over 36 units appears excessive, but is not so foolish as it appears, since heat above the temperature of oil cracking is necessary in the carburettor, and heat below this temperature must pass to steam raising. The surplus steam, however, might theoretically be added to the carburetted water gas in assessing overall thermal efficiency, making 67.5 per cent; but more properly, methods should be sought to influence the reactions in such a direction that extra steam is not produced. This could be done by blowing the fuel bed to give a higher CO_2 content in the blow gas, either by increasing the rate of blow or by preheating the air.

The production of tar is also high and indicates the need either for an improved control of cracking conditions or for the return of the tar to the generator during the down run. The sensible heat in the carburetted water gas is not used (5.2 per cent available at 730° C.) nor is that in the waste gases (7.3 per cent at 270° C.), and both could provide preheat for primary air which would in turn provide more control over the generator reactions, reduce the CO_2 in the gas made (2.5 per cent) and improve efficiency to a greater extent than is represented by the actual return of the units.

Complete Gasification Processes

When the fuel used is coal, the water gas plant does form a system of complete gasification which has had some application in the U.S.A., although not in this country.

It will be apparent that the complete conversion of coal to gas in this way must be thermally more efficient than the separate production of coal gas and water gas. It may be calculated that the advantage is of the order of 12 per cent. The calorific value of the gas, however, cannot exceed 350 B.Th.U. per c. ft., which, unless the process is associated with the cracking of oil, is a limitation on the production of town gas which has hindered the development of the combined process in this country. By adopting a special cycle, the Fuel Research Station has gasified bituminous and sub-bituminous coals in a water gas generator, realizing from the latter 210 therms of gas per ton, at 304 B.Th.U. per c. ft., i.e. 64 per cent thermal efficiency.

The combination has been effected in industrial plant (3) by superimposing a carbonizing chamber above a water gas plant, burning the blow gas in chequer work round the carbonizing zone, and sweeping the distillation zone with the hot water gas. Examples of this procedure are the Tully and the Humphreys and Glasgow systems. The procedure in the Travers-Clark process is rather different, the blow gas being burned in a separate regenerator from which heat is carried by part of the gas made back through the coal, so effecting carbonization.

In the Humphreys and Glasgow system, the regenerator is replaced by the carburettor and preheater of a carburetted water gas plant. The blow gases are burned in the carburettor, and the coal is carbonized by the sensible heat of the water gas, part of the steam for which is preheated by passage through the carburettor, and also by circulating gas with the preheated steam. The amount of recirculation gives control over the rate of the carbonization of the coal. A complete balance showing the performance of the plant is not available, but the thermal efficiency of gas making is represented by about 183 therms of gas at 350 B.Th.U. per ton of coal, or 57 per cent, including the fuel required for steam raising. A unit plant will gasify 10.4 tons per day.

The Tully Plant

A more complete balance is available for the Tully system (4) which gives an overall yield of gas of the same order. The carbonizing chamber is again above the water gas generator, and the coal is carbonized by: (*a*) The combustion of the blow gas in chequer work round the retort. (*b*) The sensible heat of the hot water gas passing through the coal. Steam is raised in a waste heat boiler using the spent blow gas, and a carburettor is sometimes added to raise the calorific value of the gas by carburetting with oil.

A thermal balance for a plant gasifying about 7 tons of Fifeshire coal per day is shown diagrammatically in Fig. 1. In this balance, the losses shown against radiation and purging are probably not reducible, and the steam raised is sufficient for the generator and for power production. The exhaust steam from the engines could, however, preheat the boiler feed water. Possible improvements

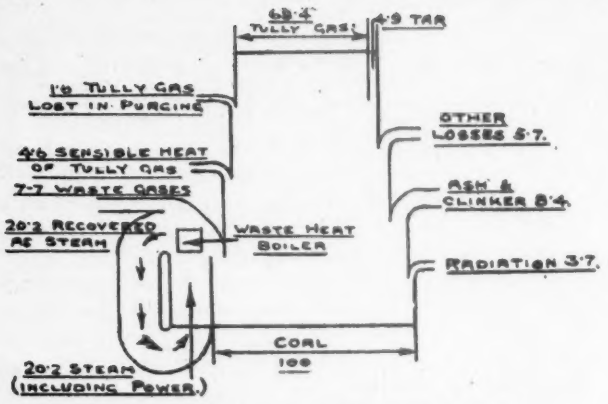


FIGURE 1. THERMAL BALANCE OF TULLY PROCESS

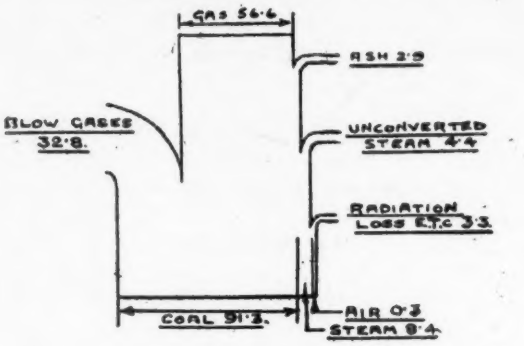


FIGURE 2 THERMAL BALANCE OF BROADHEAD PROCESS.

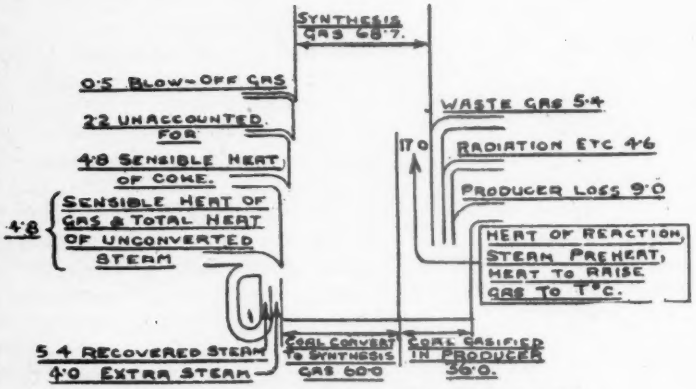

SYNTHESIS GAS 68·7
0·5 BLOW-OFF GAS
2·2 UNACCOUNTED FOR
4·8 SENSIBLE HEAT OF COKE
4·8 SENSIBLE HEAT OF GAS & TOTAL HEAT OF UNCONVERTED STEAM
WASTE GAS 5·4
17·0
RADIATION ETC 4·6
PRODUCER LOSS 9·0
HEAT OF REACTION, STEAM PREHEAT, HEAT TO RAISE GAS TO T°C.
5·4 RECOVERED STEAM
4·0 EXTRA STEAM
COAL CONVERT TO SYNTHESIS GAS 60·0
COAL GASIFIED IN PRODUCER 36·0.

FIGURE 3. THERMAL BALANCE OF DIDIER-BUBIAG PROCESS.

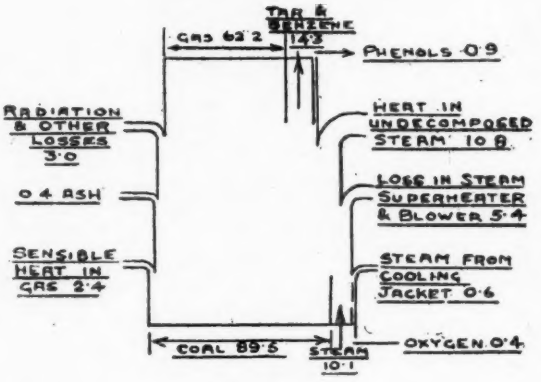


FIGURE 4. THERMAL BALANCE OF LURGI PROCESS

are the recovery of part of the sensible heat of the finished gas (4.6 per cent at 250° C.), and of the waste gas (7.7 per cent at 300° C.) by the obvious method of preheating the air. This might also give greater control over the reactions and reduce the loss of heat of reaction indicated by the 4.8 per cent of CO_2 in the gas. A further possibility lies in improving cracking conditions so as to convert the tar to gas, e.g. by returning it to the generator during the down run.

The Broadhead Plant

A variation of the combined process has been attempted in Melbourne by Broadhead (5), who has grouped three water gas generators to form a unit plant. The generators are connected in series and their functions are changed by rotation from down run to blow to up run, each for a period of the order of 5 minutes with 20 seconds purging periods. Generator 1 is blown by air, while 2 is steamed upwards and the gas from 2 passes downwards through 3. The coal is always charged at the beginning of the up run and is spread in a thin layer over the surface of the hot coke. The products of distillation are therefore cracked in Generator 3, and there is also a tendency to reduce any CO_2 formed by excess steaming in Generator 2. Further enrichment of the gas may be arranged by spraying tar into the down-run generator.

The plant at Melbourne has been used mainly with brown coal and it is interesting to find that the CO_2 content of the gas can be kept below 4 per cent. A thermal balance for the process using brown coal and gasifying 15 tons per 24 hours is shown in Fig. 2.

The radiation loss is low considering that there are three generators, and the loss in ash is also low, but, since the plant does not embody a waste heat boiler, the losses in the blow gas are excessive. The heat content of this would be more than enough to raise all the steam required to supply the necessary power. The 32.8 per cent in Fig. 2 is rather high, probably owing to the high reactivity of coke from brown coal, and it could be reduced by preheating the air and/or increasing the blast rate.

The thermal efficiency of gas coal achieved, excluding power and steam, = 62 per cent, and is therefore some way below the maximum realizable for gas coal, including power and steam. The yield at present is 121 therms of gas per ton of brown coal, at 310 B.Th.U. per c. ft.

German Processes

In Germany the development of processes for complete gasification (6, 7) has received more attention for three reasons: (*a*) the desire to utilize brown coal, (*b*) the production of CO/H_2 mixtures (synthesis gas) for the production of oil from coal, and (*c*) the more advanced use of industrial oxygen. The processes which have reached industrial application fall into three classes: (*a*) Those which involve heating by the recirculation of hot gases, e.g. Pintsch-Hillebrand, Koppers, Wintershall-Schmalfeld. (*b*) Those which involve an externally heated reaction chamber, e.g. Heller, Ahrens, Strache, Didier-Bubiag. (*c*) Those which involve the use of oxygen, e.g. Winkler, Lurgi-Drawe, Thyssen-Galoczy.

Of those in group (*a*) the Pintsch-Hillebrand can be taken as an example. Brown coal briquettes are carbonized in a circular chamber 40 ft. high by 25 ft. diameter, and fall

into a gasification chamber with a continuous ash removal device. The base of the chamber is a regenerator in two sections, one half heated by externally generated producer gas. The gas from the carbonization zone is detarred, added to some of the water gas from the gasification zone after the sensible heat of the latter has been used to raise steam, and recirculated with steam through the gasification zone via the other half of the regenerator. Using brown coal, a generator gasifying 50-60 tons per day has produced 94 therms of gas per ton, at a calorific value of 260 B.Th.U. per c. ft. and an overall thermal efficiency of 50 per cent. The latter is low and it is understood that it has been greatly increased in recent plants; 180 therms of gas per ton has been quoted.

In group (*b*) the Strache process is similar in principle to that of Tully. The Ahrens process was specially designed to treat brown coal briquettes; the oven is a narrow chamber 6 to 14 inches wide and externally heated by producer gas made from the coke. It has four zones, (i) top drying zone (300° C.), (ii) low temperature carbonization zone, (iii) coking zone (1,000° C.), (iv) water gas zone. The water gas from zone (iv) is preheated by waste heat and blown back through zone (iii) downwards to an offtake a little above zone (iv), a procedure stated to favor the production of some methane.

The process does not gasify all the coal, and some coke is available for sale. A typical thermal balance is as follows:

Fuel 100.	Gas	10.7
	Tar	Nil
	Benzole	4.6
	Coke to producer	19.1
	Coke sold	32.9
	Loss	2.7

The efficiency of the process is therefore low as a machine for total gasification, but is satisfactory (78.2 per cent) as a carbonizing system. A unit chamber will gasify 10 tons of brown coal per day, giving 17,500 c. ft. of 505 c.v. gas.

The Didier-Bubiag Process

The Didier-Bubiag process also embodies a continuous vertical chamber oven, 30-35 ft. high, 13 ft. deep, and 12 to 14 in. wide, externally heated by producer gas. It is of more interest in this country since it has been designed to gasify not only brown coal but non-caking bituminous coal of small size (2½ in.), preferably free from fines. One chamber will gasify about 7 tons of bituminous coal per day, producing 60,000 c. ft. of gas per ton at a calorific value of 375 B.Th.U., and giving as by-products 10 per cent of fine coke breeze, 5 per cent of tar and 1 per cent of benzole.

Coal enters the retort through an extra chamber on top which is heated by waste gases, where it is preheated or partly carbonized. It then passes downwards through the chamber (1,350° C.), while preheated steam (400° C.) ascends. The coke is not all gasified, sufficient being extracted to supply the gas producer. This is advantageous, since gasification to ash introduces difficulties into a carbonizing system.

The main gas offtake is about one third down the chamber, and part of the sensible heat of the gas (at 750° C.) is recovered in a waste heat boiler. Any gas from the top chamber is added to the producer gas for heating the reaction chamber. When using brown coal, the CO_2 and water from the top stage of preheat are discarded to avoid diluting the gas.

This retort is relatively large for its output, but has had industrial success as a flexible means of making synthesis gas at an H_2/CO ratio of 2, with the minimum of difficulty. Although the overall efficiency is fairly high for a process of this type (68.7 per cent), Fig. 3 shows some opportunity for improvement. The 4.8 per cent lost as sensible heat of coke could be reduced by charging the hot coke to the producer, and a built-in producer might reduce the producer loss of 9 per cent.

The process is not self-contained as regards steam, but it is unlikely that more could be done with the residual heat in the flue gas or synthesis gas than to preheat the feed water to the waste heat boiler or the producer jacket. The radiation, etc., loss from so large a chamber is satisfactorily low. The gas made contains rather a high proportion of carbon dioxide (11 per cent): if this could be reduced to the monoxide the thermal efficiency could be improved considerably, as has been shown above for producer gas, but the H_2/CO ratio would be upset. A thermal balance of the process when treating brown coal is shown in Fig. 3.

Processes Using Oxygen

The most spectacular advances in total gasification have been brought about by the use of oxygen, but this has been made possible only by the availability of by-product oxygen from synthetic ammonia plants which use liquefaction technique. The production of oxygen by liquefaction is as yet thermally inefficient (about 15 per cent) and it should be understood that the thermal cost in power to produce 1,000 c. ft. of oxygen under pressure is as high as 2.5 therms, as compared with 0.4 therm for the equivalent amount of oxygen in the form of low pressure air.

Of the oxygen using processes developed in Germany, the Winkler and Thyssen-Galoczy operate at atmospheric pressure, using either oxygen or air enriched with oxygen, but much greater interest now attaches to the well known process of Lurgi, which employs oxygen of a purity of 85 per cent or more, and is operated at the high pressure (for gas-making processes) of up to 25 atmospheres.

The Winkler producer is of the ordinary flat grate type, and gasifies graded fuel of small size (0 to 5 mm.). Part of the blast enters at a high rate near the grate, and keeps the fuel "fluidized," and a secondary blast enters at a higher level. The blast may be air, air and steam, 50 per cent oxygen and more steam, or pure oxygen and much steam; the steam is raised by the sensible heat of the gas made.

A standard generator of 8 to 9 ft. diameter will gasify 40 tons of coal per hour and produce about 48,000 cu. ft. of gas per ton at 305 B.Th.U. per c. ft., with an overall thermal efficiency of about 77 per cent, excluding power for oxygen production.

The Thyssen-Galoczy producer is a slagging ash producer with no grate, rather like a modified blast furnace. It has a conical base, with a ring of jets for the introduction of oxygen and some of the finished gas. A further ring of inlets for air, oxygen and steam are arranged just above the first ring. Gas offtakes are provided at the top, one centrally to prevent excessive heating round the producer walls, and one at the side. Just sufficient gas is introduced with the oxygen at the bottom to raise the temperature to reaction level. In this way, the use of too much oxygen is avoided, and the temperature reached is controlled so that the slag is melted without reaching a temperature which would endanger the brickwork.

Very little is known of this process, but it is reported that, having no grate, it will gasify non-caking coal of any size and ash content at a very high rate, producing gas of a calorific value of 340 B.Th.U. per c. ft., and at an efficiency of 90 per cent including the recovery of the tar, which is reduced to 80 per cent, allowing for oxygen production.

The Lurgi Producer

The Lurgi or Lurgi-Drawe producer is a thick walled steel cylinder rounded at each end and lined with refractory material. A standard generator, as designed for the gasification of 21 tons of dry brown coal per 24 hours, was about 10 ft. high and of 13 sq. ft. section. The fuel feed and gas offtakes are at the top, the former operating through a pressure lock, and steam and oxygen enter the generator below a rotating grate. Mean temperature of operation is low, about 500° C., and sensible heat escaping in gas made represents an unusually low proportion of the heat in the fuel.

The generator is blown with steam and oxygen preheated externally to 500° C. at pressures of about 20 atmospheres. The great interest in the process centers upon the fact that the rate of synthesis of methane increases with increase of pressure, until at 20 atmospheres pressure, and under equilibrium conditions, the purified gas contains sufficient methane (about 22.6 per cent) to bring its calorific value up to the normal town gas level of 500 B.Th.U. per c. ft. Under these conditions the reaction $2CO \leftrightarrows CO_2 + C$ moves to the right, and the proportion of CO_2 in the crude gas is high (about 30 per cent). The crude gas is therefore washed with water under pressure, which reduces its CO_2 content to about 2 per cent, and removes H_2S.

The standard generator, which is now much larger than the above (about 50 sq. ft. cross section), gasifies brown coal at the high rate of about 150 lb. per sq. ft. of cross section of grate per hour, consuming 150 c. ft. of oxygen and 70 lb. of steam per 1,000 c. ft. of finished gas, and producing 185 therms of gas per ton at 450 B.Th.U. per c. ft. Allowing for the preheating of steam and oxygen the net yield is about 145 therms per ton. The output using non-caking bituminous coal is less, or conversely the calorific value of the gas is lower at the same output, owing to the lower reactivity of bituminous coal. The consumptions are in the weight ratio of 2/1 and in a thermal ratio of 1.3/1 in favor of brown coal. The thermal balance of the process is illustrated in Fig. 4.

The first observation from Fig. 4 is the overall efficiency of 62.2 per cent, which is not high; the main reason for this is the exothermicity of the reactions by which 15.8 per cent of the carbon of the fuel is converted to CO_2. The relatively low temperature of operation (500° C.) accounts for low radiation, etc., losses, and the difficulty of recovery of heat from the gas made, most of which is heat of condensation of water, available only at about 100° C. The process has probably therefore reached the peak of efficiency, unless the course of the reactions can be influenced. This, however, is not a heat transfer problem.

It would be most interesting to apply this process to British coals, and the Gas Research Board hopes to do this as soon as may be possible.

Gas Research Board Processes

Alternatives to the use of oxygen as a means of producing gas of high calorific value in a process of complete gasification are embodied in the researches of the Gas Research Board.

The first involves the synthesis of gas rich in methane from CO/H_2 (water gas) mixtures, and the use of the rich gas to "carburet" more water gas, the methane replacing gas oil.

The reactions of methane synthesis are catalysed by nickel at a high space velocity, but the use of nickel necessitates almost complete removal of organic sulphur from the synthesis gases.

The activity of a nickel catalyst at atmospheric or greater pressures is such that the methane percentage in the treated gas represents equilibrium conditions, as is shown by the following figures:

Temperature, ° C.	450	650
Pressure, atmospheric	1	20
Vols. of gas per vol. of catalyst per hour	2,000	7,000
Methane, per cent in treated gas	60	55

The researches of the Gas Research Board have brought to an intermediate scale of development the purification of the synthesis gas from sulphur and the control of the synthesis reactions. It remains, if and when this stage is successfully passed, to combine the processes with water gas production, so as to utilize the waste heat of the latter process plus the exothermic heat of reaction of methane synthesis (about 49,000 calories per gram molecule of methane) in order to determine whether the complete process would compete thermally and economically with that of c.w.g. production. It would be unwise to make an estimate at this stage.

The second alternative investigated by the Gas Research Board involves the gasification of coal under pressure in the presence of hydrogen, the hydrogen being produced by any sufficiently cheap process, but possibly by the gasification of coke in oxygen by the Lurgi process.

The experimental work leading to the examination of the process on an intermediate scale has already been described by Dent in a paper (8) which I would recommend you to read. The evaluation of problems in the intermediate stage is now being made. In this stage, 300 lb. of coal is subjected to the action of hydrogen preheated to a sufficient temperature to initiate the reaction. This consists essentially of:

(*a*) The hydrogenation cracking of the volatile matter in the coal or coke to give methane with practically no oxides of carbon or free hydrogen.

(*b*) The breakdown of the carbon nucleus under the action of hydrogen, again to give methane.

The reactions are strongly exothermic, and the temperature rises unduly and, if not controlled, would reach a point where methane formation is inhibited. The reaction, however, passes through the coal in a remarkably short time before it arrests itself, leaving a coke residue which is highly reactive. The rate of formation of this coke is very much greater than in any other carbonizing process (4 to 5 ft. per hour, as against less than 1 in. per hour in a coke oven). The main problem at this stage of increase of scale is to control the reaction, either by imposing upon it an endothermic reaction (e.g. by using a steam/hydrogen mixture), or by other means, and to examine a variety of coals. The subsidiary problems may be generalized as a thorough exploration of the reactions on this scale.

The next step will be the difficult one of devising a full scale process in which not only are the reactions under complete control but the process is mechanically operable on an industrial scale. What form the pilot plant may take it is at present impossible to say. It may involve the complete conversion of the coal to gas by hydrogen, or perhaps partial conversion to coke, using part or all of the coke to produce the hydrogen. The latter could presumably be carried out by the Lurgi process, but the former would probably break new ground in departing fundamentally from the principle of the intermediate scale generator.

(Concluded on page 60)

Wage Incentive and the Tax Cycle

A "Wage Incentive Conference," sponsored by the National Industrial Engineering Society, was held at Northwestern University, Chicago, May 27th, 1945.

Among the speakers invited to address the meeting, was James F. Lincoln, President, Lincoln Electric Company, Cleveland, Ohio, who has been a foremost exponent of the "Incentive" wage plan, which has worked out so successfully in his company. We quote from Mr. Lincoln's talk.

"Here is the most important thing, I think, from the point of view of 60 million jobs—in our company for a period of years we have continuously reduced the cost and selling price of our product with the result the number of people employed has increased by more than three times. It is perfectly obvious why that should occur. You know perfectly well that the selling price determines the amount of any useful product that is going to be used.

"Let me cite it this way: During the last year that automobiles were made without restriction, there were 15 million automobiles sold—11 million second-hand cars and 4 million new cars. Why did people buy 11 million second-hand cars? Certainly they would rather have new cars than a second-hand one. For one reason, and one reason only—because they cost less. There cannot be the slightest doubt in anyone's mind that if you had 15 million new cars to sell at the prices of the second-hand ones, there would be 15 million new cars sold.

"In connection with 60 million jobs, we are thinking that this is a matter of government; we should be thinking of the matter of taxes. I think the situation is all tied together very closely, and I want to cite just one or two things. We are talking loud and long about government's responsibility to see that the individual has a job, has a living. Did you ever stop to think that the only way the government can do that is by taking money away from the individual? Government never did and never can make a dollar. The only money it can ever have is what it takes away from the individual in taxes.

"Don't forget that every tax, no matter what you call it, eventually comes out of the ultimate consumer. It doesn't come out of the manufacturer; it doesn't come out of the rich man as such; it comes out of the ultimate consumer. The rich man pays tax only to the extent that he is an ultimate consumer.

"You say, 'That's cockeyed, that can't be true.' Let me illustrate it to you by our own company. It happens that we are a manufacturer of material that is used in the oil industry. We sell a welder to the Standard Oil Company. Do you think there is any doubt but what we add all of our taxes to the cost of our product? Where else could we get the money to pay them except by adding it to our sales prices? Therefore, the Standard Oil Company pays our taxes. But they don't either; they add it to the price of gasoline, which is the only place from which they can get the money to pay their taxes. Along comes Joe Glutz and buys ten gallons of gasoline. He pays the Standard Oil Company taxes, and he pays the Lincoln Electric Company's taxes. But that isn't the end of it. We buy a great deal of our raw products from the United States Steel Corporation. Is there any doubt but that the United States Steel Corporation adds their taxes to the cost of their product when they sell it to us?

"Of course, government will give you a guarantee of jobs. Every man shall have a job. The politician is long and loud in telling you that every man will have a job; there will be 60 million jobs, whether or not they are wanted. We are going to have 60 million jobs. That is fine. But where are they going to get the money for these jobs? They are going to take it away from the ultimate consumer.

"The greatest danger that America faces is the danger that people will say, 'We'll give you our freedom if you will only make sure that we don't have to take care of ourselves.' We are willing to trade that freedom—the freedom that has allowed us to become the greatest nation in the world, for security, for the promise of a job. That is the thing we are facing; that is the thing that America must decide.

"Do not forget that we have been faced with that same problem three times. Once was when 102 Pilgrim fathers came over here, and more than half of them died of starvation and exposure the first winter but did they go back to security? They did not. They wanted freedom. They didn't know what security meant. A hundred and fifty years later the vast majority of the educated, the wealthy, still wanted to be subjects of England, but the love of freedom, as Patrick Henry put it, 'liberty or death,' captured the imagination of those people, and we became free from England. The same thing occurred in '60 and '61. You know what happened then.

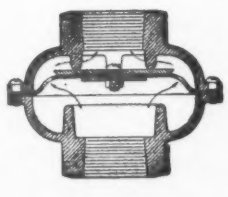
"You have a more insidious condition at the present time because you can't understand, perhaps, because we have never seen it, how government can take our freedom away. It seems impossible, but look at what has happened in every other country in the world. The only one that has a chance to retain its freedom is the United States of America."

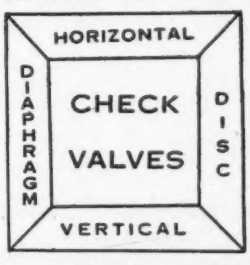
Fort Meyers, Fla. to Expand City Gas Plant

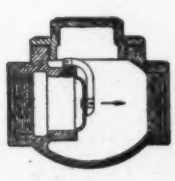
The city council of Fort Meyers, Fla., has approved a project for expansion and rehabilitation of the municipal gas plant and authorized Mayor Dave Shapard to ask for bids on the work which is estimated to cost $50,000.

The work is part of a general program for bringing the gas system up to date. The complete program calls for overhauling the mains and for laying a new high pressure main to relieve the low pressure areas in outlying residential sections.

Pressure Controls for Gas and Air



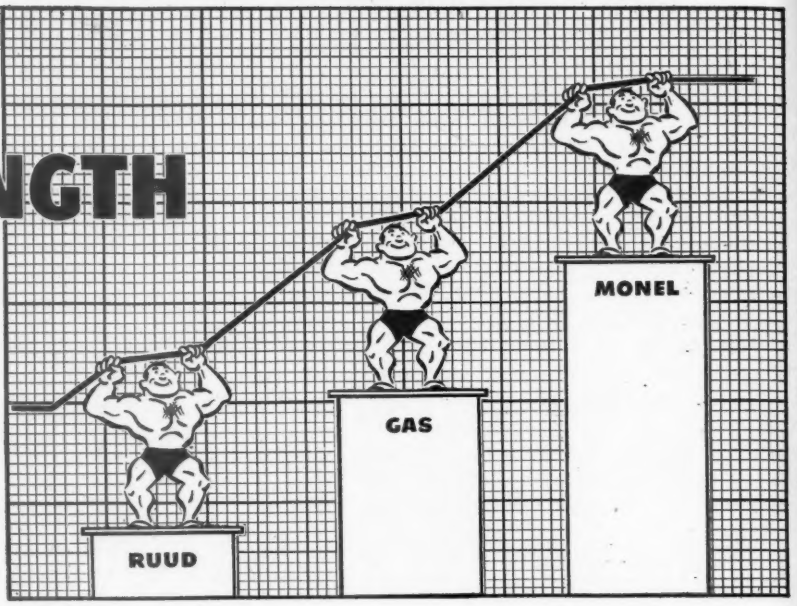




NORWALK VALVE COMPANY

35 Railroad Ave. South Norwalk, Conn.

Here's TRIPLE STRENGTH to BOOST the LOAD!



Are you looking over the field... trying to line up the *right* appliances for post-war sale?

Now is the time to consider the *triple-strength* story behind Ruud... *GAS*... and Monel.

When you handle Ruud Automatic Gas Water Heaters, every customer gets *more* than just a water heater. He enjoys the extra comfort and convenience known only to those who have *perfect* hot water service.

And these 3 powerful factors work to bring your customers this perfect service:

1. ***RUUD,*** a recognized leader in the field, has manufactured quality water heaters since 1889. Ruud makes *only* water heaters, and makes them only for...
2. ***GAS,*** the blue ribbon fuel, which—as we keep reminding your customers through national advertising and promotion—is clean, convenient, economical...and *dependable.*
3. ***MONEL,*** the rustproof nickel alloy used for Ruud tanks. Water always comes out as clean as it goes in. Monel tanks are long-lasting and trouble-free; they reduce service and maintenance problems.

Count on Ruud-Monel performance to build prestige and good-will for *GAS.* There's a model for every household, as well as for many commercial uses.

Get set to cash in on this triple-strength line. Investigate now. *No other water heater can offer you as much!* Your inquiry will receive immediate attention.

H_2O HOT STUFF

George Westinghouse was an inventor of gas equipment before he turned to electricity. And one of his right-hand engineers in those days was Edwin Ruud, inventor of the Ruud Automatic Gas Water Heater.

★ ★ ★

Thirty-four years later, there was another Ruud-Westinghouse tie-up when Westinghouse used one of the first of all commercial programs on the air—the Ruud Light Opera Hour—in its first experiments with shortwave broadcasting between Pittsburgh, Pa. (KDKA), and Springfield, Mass. (WBZ).

★ ★ ★

With new automatic clothes and dishwashers on the way—with new homes to have more bathrooms and lavatories—with the growing public consciousness of the importance of cleanliness to health—the automatic gas water heater rates as one of the most important of all post-war home appliances. Sell a good water heater—sell Ruud-Monel.

★ ★ ★

A national magazine says that the average American housewife walks more than 3,000 miles a year. In many a home, a Ruud-Monel will reduce that figure by 500-1000 miles . . . easily . . . simply by having hot water on tap at all times, at all faucets, without thought or attention.

★ ★ ★

Recommended for insomnia—a warm Ruud-Monel bath for 20 minutes. Pat dry, drink something hot and go to bed.

★ ★ ★

The new Ruud Multi-tube Automatic Gas Water Heater is now in production. Nineteen sizes are made to serve many commercial and industrial requirements. Write for a catalog.

RUUD MANUFACTURING COMPANY
PITTSBURGH 1, PA.

RUUD GAS MONEL

... perfect partners for *Automatic Hot Water Service*

Gas Water Heating and Gas Heating Councils of P.C.G.A. Discuss Standards and Sales Promotion

By

Fred A. Herr

THE Gas Water Heater Council and Gas Heating Council of the Pacific Coast Gas Association met in the auditorium of the Southern California Gas Co., Los Angeles, on July 25.

Each session was limited to half a day. They were scheduled for July 25, a day before the opening of the two-day American Gas Association technical conference at the Los Angeles Ambassador Hotel, to enable out-of-town gas men to attend both gatherings on one trip to Los Angeles.

The Water Heater Council convened with approximately 45 utility and manufacturer representatives in attendance. Clyde H. Potter, Southern Counties Gas Co., presided, with Arthur Dolan, White Heating Co., as co-chairman.

Principal order of business was the presentation and adoption of the report of a committee which had been appointed at the council's meeting on February 21 to draft a water heater sizing chart.

The report, read by Mr. Dolan, set forth that among the factors which had been considered by the committee were the following:

The generally recognized fact that hot water service in most homes in the past has been inadequate.

The probable increase in the use of hot water because of a new and greater knowledge concerning sanitation and proper temperature of hot water for various tasks.

And the new uses for hot water which will be occasioned by the wider use of automatic laundry machines and dishwashers after the war.

The committee submitted a sizing chart for minimum recommendations for normal average domestic hot water requirements in automatic gas water heaters. These recommendations, the report stated, are based on the initial premise that no heater of less than 30 gallons storage capacity should be specified for domestic installations. The report accented that the fact that most 20 gallon size, or smaller, water heaters have not supplied adequate hot water, and that the life of an adequately sized heater with normal usage is much greater than that of an overworked undersized heater, justifies the committee's recommendation.

Sizes Based on Number Bedrooms

As shown by the accompanying chart, the sizes are based on the number of bathrooms and bedrooms, as indicating "potential" tenancy, rather than on the number of persons who may be occupying the house on any given date. The report stated the committee felt that only on such a basis can adequate hot water service be assured for guests, changes of tenants and emergencies.

"The committee feels that any chart, to be of value, must be acceptable to utility companies, manufacturers and dealers alike," the report stated, "and must be in such simple form as to be easily applied by sales people and readily understood by prospective purchasers. To that end the committee has purposely avoided any requirement for complicated calculations in the use of the chart and believes that the form of the chart and the sizing recommended will fully meet these conditions."

It was pointed out in the report that by closely following the sizing recommendations of the chart, the consumer will be assured of adequate hot water service under average conditions, and that, in most instances, the water heaters will have longer life, thus creating a satisfied customer for both the manufacturers and the utilities.

The committee emphasized, however, that if the sizing chart is to accomplish its maximum purpose, it should bear evidence within itself that it does represent *minimum* recommendations of the gas and allied industries, and its use must be advertised and promoted by all interested parties.

Four Point Program Urged

To that end, the committee recommended a four point program to promote support and acceptance of the sizing chart:

1. . . . That the charts used in the several territories of the PCGA be endorsed by the serving utility company, local and State plumber and dealer organizations and, if possible, by FHA and architect-builder groups.

2. . . . That an attractive wall chart, possibly 26x40 inches in size, and bearing the endorsements, be prepared for distribution to dealers for posting in prominent places in their water heater show rooms.

3. . . . That small pocket charts be prepared for plumbers and salesmen working in the field, for their and their customer's ready reference to industry recommendations.

4. . . . That the desirability of following chart recommendations be referred to in utility company, manufacturer and PCGA advertising.

The report of the committee was adopted by the council without dissenting vote. A special committee was named to carry out the recommendations of the sizing chart committee for promoting endorsement and acceptance of the charts by plumber, dealer, architect and builder groups and the FHA.

Report on Sales Promotion

In rendering a report of the Sales Promotion Committee of the Water Heater Council, R. V. Davis, of the A. O. Smith Corp., Los Angeles, explained that the committee was of

RECOMMENDED SIZING CHART

Number of Bathrooms	Number of Bedrooms	Storage Capacity In Gallons
1	1 or 2	30
1	3 or 4	40
2	2 or 3	40
2	4 or 5	50
3	3	50
3	4 or 5	60
4	4 or 5	70

the opinion that topics selected for exploitation should be general in nature rather than specific, that they should consist of things that "everyone can get behind and push."

The committee concluded that three objectives of water heating promotion should be:

To generate greater appeal for the automatic gas water heater by disseminating information on the valuable service that can be obtained from such units; to prepare and distribute articles and pamphlets designed to encourage builders, architects and home owners to provide a suitable and adequate location for the water heater; and to educate dealers to the need of proper sizing, this to be tied in with the new sizing chart.

The committee, Mr. Davis reported, has undertaken the preparation of four pamphlets to provide information on gas water heaters, which were expected to be ready by August 15. Subject matter of the pamphlets deals with:

Proper sizing as a tie-in with the new sizing chart; emphasis on the important role hot water plays in the average person's life, condensed into a pamphlet entitled "Hot Water in Your Life"; a pamphlet presenting specifications for installing water heaters; and one emphasizing the need for proper display of water heaters in plumber, dealer and appliance dealer display rooms.

The committee's report was adopted by unanimous vote and the committee was authorized to proceed with its plan for tieing in the pamphlet program with the sizing chart promotion.

Location of Water Heaters

The need for developing co-operation by builders, architects and home owners in providing suitable locations for water heaters was discussed by the Council.

H. W. Geyer, of Los Angeles, declared that proper installation of water heaters warrants the council's serious attention. He pointed out that the location of the original heater in the home is important because the replacement usually is installed in the same location.

Pro et con opinions were elicited concerning a suggestion that encouragement be given to installing water heaters in the kitchen rather than on the service porch or in the basement or attic. While a number of adverse opinions on kitchen installations were offered, Mr. Davis urged that action be taken now by the gas industry to design a water heater suitable for kitchen installation so that the industry will be in position to supply such a unit to customers who insist on having the water heater in the kitchen.

Opinion in general was that the conventional types of water heaters would not lend themselves suitably for installation in kitchens but that the table-top or cabinet types possibly would be adaptable to that purpose. One argument advanced was that the presence of the water heater in the kitchen would make the housewife more "water heater conscious" than if it were set up in the basement or some other location where she would see it only rarely.

R. D. MacMahon, general supervisor of commercial sales, Southern California Gas Co., was appointed chairman of a newly established committee on volume water heating for restaurants.

This action was taken when the paucity of information concerning water heaters for volume heating in commercial establishments arose as an offshoot of the previous discussion. The difficulty of arriving at a sizing chart for restaurant water heaters was emphasized, the point being made that, due to the varying hot water requirements by restaurants, it would be difficult to devise an effective sizing chart for such water heater installations.

Opinions were offered that a committee of utility company representatives assemble facts on the subject so that manufacturers would have some standard to guide them in their production of volume water heaters.

The MacMahon Committee, therefore, was delegated to assemble data on the subject, which will be distributed to plumbers, heating contractors, appliance dealers and manufacturers.

An outline of the American Gas Association's Architects Manual on Modern Gas Service (see below) was presented by Mr. Jacobs and Mr. Geyer, at the conclusion of which the council voted to participate in furthering the manual project in its area.

Gas Heating Council Meets

The Gas Heating Council of the PCGA convened at 1:30 p.m., July 25, under the chairmanship of George Merkel of the Southern California Gas Co., with 48 representatives of heater manufacturers and utility firms in attendance.

There was a thorough discussion of the Certified Performance heating program being proposed by the A.G.A. and A.G.A.E.M. Committees. The council, however, again came to the conclusion that the program, as now set up, is not adapted to Pacific Coast Conditions. (Previous discussion on this subject was held by the council on January 17 (see March, 1945, issue, AMERICAN GAS JOURNAL, page 22).

Instead, the council, on July 25, adopted a motion calling for appointment of a committee to draft a set of specifications whereby installers of gas heating systems and unit heaters may be guided in making installations.

In the discussion which preceded adoption of the motion, W. M. Jacobs, of Los Angeles, Clifford Johnstone, of San Francisco, associ-

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For Sound Values and Continuous Operating Economy
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ation secretary, and others, emphasized the value of an association sponsored set of heating installation specifications which would serve, they pointed out, as a standard for efficient work, without bearing a label of approval or carrying a guaranty of the unit itself.

In supporting the proposal, Mr. Jacobs commented: "If the heating contractor is in a position to say to his prospect: 'This heating job will be installed according to standards and specifications drawn by a committee of utility and manufacturer experts of the Pacific Coast Gas Association,' it will be of invaluable help to the contractor or dealer in selling more gas heating."

The council plans to submit the specifications to plumbing and heating contractors, associations of such operators, FHA officials and others, whose collaboration will be sought on the plea that efficient installation practices will result in increased gas heating business for all concerned.

Support by Gas Heating Institute

L. M. Hull, president, Institute of Gas Heating Industries of Southern California, endorsed the principle of the plan and promised the cooperation of the members of his group toward promoting acceptance of a set of installation specifications.

A report of the Architects Manual of Modern Gas Service sponsored by the A.G.A. Housing Committee was presented by Mr. Geyer of Los Angeles. He explained the present status of the project and read various recommendations which have been submitted by west coast gas men for inclusion of added material in the volume.

It has been suggested, Mr. Geyer reported, that the first chapter in the manual consist of a listing of gas company policies, rules and regulations, pipe sizes, location of meters, etc., and names and addresses and telephone numbers of key executives. Manufacturer's specification sheets are now being solicited, Mr. Geyer declared.

The Gas Heating Council of the Pacific Coast Gas Association voted approval of the manual project and will further its acceptance and advancement in the western states.

W. Pomar, Sales Manager

Warren Pomar has been appointed sales manager of the St. Augustine Gas Co., St. Augustine, Florida. Mr. Pomar first became connected with the company in 1921, and with the exception of a short period, has had continuous service with the company.

"MY DREAMS ARE GETTING BETTER all the time." And the brightest spot in women's dreams is the *center* of tomorrow's kitchen, an Estate Heatrola Range. So far ahead that it fits right into the most streamlined future. The Estate Heatrola Range was first to introduce the modern, table-top design. First with the Air-Flow Oven. First with the Grid-All. First with the exclusive Bar-B-Kewer (separate meat oven). First with so many features for extra convenience and economy and beauty that it's first choice of homemakers, architects and builders who will turn today's better dreams into tomorrow's better kitchens.

NO MORE MEALTIME TRAFFIC JAMS AT the oven door with an Estate Heatrola Range. For it's the range with the wonderful Bar-B-Kewer (separate meat oven). This unique feature enables a woman to broil a whole chicken, roast or ham while she bakes a layer cake, pies, biscuits *at the same time.*

THE FUNCTIONAL BEAUTY of Estate Heatrola Ranges is what appeals to so many architects and builders. They recognize this famous range as not only strikingly handsome, in key with modern kitchen design... but also as the range with the years-ahead features to make kitchen hours easier, fewer.

Estate Heatrola Ranges are made by The Estate Stove Company, Hamilton, Ohio . . . First with the finest for over 100 years

Training of Sales Personnel

A.G.A. Course Now Available for Gas Companies and Manufacturers

THE American Gas Association's Committee on Selection and Training of Sales Personnel has announced a new type of basic training course in "Fundamentals of the Gas Industry," which will be available to all gas companies and appliance manufacturers this month. This is believed to be the first major industry to undertake such a program on a nationwide scale.

The new course is divided into three units and is flexibly set up so that it can be presented in three one-hour or six half-hour sessions.

The first of three steps to develop a thorough, comprehensive program looking toward increased sales of gas service and appliances was undertaken by the committee sometime ago when it presented to the industry a widely-accepted plan for selecting salesmen to meet the high standards of gas utilities.

The second phase was the preparation of the basic training course in "Fundamentals of the Gas Industry," which is suitable for all employees, and particularly those whose duties bring them into repeated contact with customers and the public.

The third step calls for the presentation of a highly specialized course, now being prepared, for salesmen, dealers and allied employees. It is entitled "Residential Gas Salesmanship" and will be available to the industry late in 1945.

Urge Immediate Action

With the timely warning that "green troops don't win battles," the committee strongly recommends to gas utilities that they move immediately to train and prepare their personnel for the period of unprecedented readjustment that lies ahead.

When the committee undertook its task, it recognized at once that training for gas utility personnel must be interesting as well as valuable. The new course is as thought-provoking, informative, and interesting as the most modern tested training tools and methods can devise. It utilizes narration, sound slide-films, and text to show clearly how mistakes in dealing with people can be minimized or eliminated. It promotes initiative and teamwork by dramatizing incidents in which these characteristics help produce sales.

The course was prepared by TradeWays, Incorporated, New York City, an organization with long and varied experience in training personnel for industrial and service concerns.

The AGA committee, under the chairmanship of Mr. R. E. Williams, of the Binghamton, New York, Gas Works, has pointed out that all producers and manufacturers of gas service and appliances will find the new course suitable for their use. In achieving its purpose the course clings closely to its broad educational intent and contains no controversial material to conflict with existing policies or employee relationships of any gas utility.

Although some companies will use the AGA training course as it stands, the committee is convinced that utilities will derive even more benefit from it if they add supplementary instructions on their own policies and activities. Mr. Williams has urged each company to augment the course in this way. "Every utility has its own problems, which lend themselves to special study," he observed. "Employees enrolled for the AGA course, which treats the industry as a whole, will be well prepared for supplementary training adapted to local needs and conditions."

Department Heads Can Carry-On

Since the Course is so organized that professional instructors are not required many companies are planning to make department heads and supervisors responsible for the leadership of study sessions. They will be furnished with Leaders' Guides which supply all the information needed to conduct the Course.

For best results the training groups should be small. Groups of between five and twenty persons can best cover the program in a minimum amount of time at a minimum of expense to the sponsoring company. There are no examinations in the course and no papers to be turned in.

Procedure

The opening unit, "Gas—the Fuel," presents to enrollees the facts about the progressive record of the industry, its growth and its long background of service to its customers. The second unit, "Gas—the Service," studies the cultivation of good public relations, demonstrates the importance of contacts with customers and explains correct methods. The third unit, "Building the Gas Load," shows all employees how they can assist in developing markets for gas service and appliances.

Prior to the meeting on each unit, each individual enrolled is given a printed narrative of a true-to-life sales case. When the meeting opens the case is discussed. Then a lively ten-minute sound slide-film analyzes the case, showing how situations might have been handled to maintain good customer relations and to promote sales. Following additional discussion, a second sound slide-film, or "talking text," presents the methods which employees should follow. At the close of the meeting, a bound text is given to each individual for study and review. It is well-illustrated and easy to read.

Throughout the Course employees are shown how their own opportunities for advancement are enlarged when they take a genuine interest in the company's progress. They are told convincingly how an expanding industry strengthens their community and enhances the welfare of those associated with it.

Information about this basic course and about the specialized program for salesmen now being prepared, is obtainable from Mr. R. E. Williams, Chairman, Committee on Selection and Training of Sales Personnel, American Gas Association, 420 Lexington Avenue, New York 17, New York.

The full membership of the AGA committee, in addition to Mr. Williams, is as follows:

J. J. McKearin, Boston Consolidated Gas Co., Boston; W. L. Hutcheson, Manufacturers Light & Heat Co., Pittsburgh; R. J. Canniff, Servel, Inc., Evansville, Ind.; Dean A. Strickland, United Gas Corp., Houston; R. A. Gordon, Washington Gas Light Co., Washington, D. C.; Henry J. Dropp, Milwaukee Gas Light Co., Milwaukee; E. M. Demlow, Citizens Gas and Coke Utility Co., Indianapolis; J. S. C. Ross, Pacific Gas and Electric Co., San Jose. Cal.

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Only the Harper Burner System does this accurately. Each burner is actually 2 burners in 1... a burner within a burner ...both operated and controlled by a single handle. The small, inner *cooking* burner can be used entirely independently of the outer *starting* burner. No other top burner possesses this vital advantage—which insures easy, accurate control: just the right heat for every type of top burner cooking.

In the top burner field, the Harper Burner System is the *answer* in the AGA campaign of appliance improvement and promotion to expand the position of gas as the ideal cooking fuel... for cooler, cleaner kitchens.

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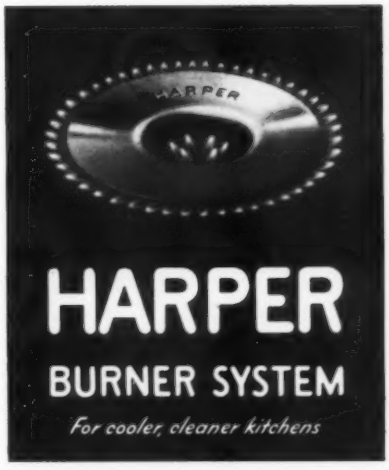

ARMY E NAVY

On next page
WHAT USERS SAY

Robert Patterson

"I want the HARPER BURNER SYSTEM on my next range"

Having once enjoyed the many advantages of the Harper Burner System, most women state emphatically that their next range must be Harper equipped. Here is a typical statement from Mrs. John V. Callahan, 23 Plymouth Ave., Milton, Mass.:

"I really feel that the Harper Burner System is one of the greatest cooking discoveries in many years. It is so economical, makes cooking less of a chore, and gives far better cooking results. I want it on my next range."

Why women like the HARPER BURNER SYSTEM

"More of the important vitamins and minerals are retained in foods." Mrs. A. D. Johnson, Edgewood, R. I.

"Waterless cooking," using only a cupful of water, gives health-building food. Vitamins are not poured down the sink in excess water.

"I like its fuel economy." Mrs. Anna M. Livingston, Ozone Park, N. Y. Savings of as much as 39 per cent in fuel consumption are possible with the Harper Burner System because less water need be used and the tiny cooking flame consumes a minimum of gas.

"It doesn't overheat my kitchen." Mrs. Mary Von Achen, Richmond Hill, L. I. It is a test-proven fact that kitchens stay as much as 9 degrees cooler when equipped with the Harper Burner System.

The Harper Burner System operates on the principle of "2 burners in 1"... a STARTING BURNER plus a small, economical COOKING BURNER, both controlled by the same handle. It is subject to finer gradations of low heats.

NOTE: A *new* and *improved* Harper Burner System is now available for range manufacturers who are producing deluxe ranges. Harper-Wyman Company, 8562 Vincennes Avenue, Chicago 20, Ill.

HARPER BURNER SYSTEM

"HOLDS THE LINES FOR GAS"

HARPER BURNER SYSTEM

—One of the standards of top burner performance under cp

Automobile Driving Tests

A Report by Kirby Smith
Southern California Gas Co.

THERE were three distinct branches of driving technique which, in the preparation of the test, were considered as being the most essential to a company driver, namely, the observance of safe driving practices, an appreciation of the subject of public relations (from the driver's angle) and the conservation of equipment. Our problem, then, became one of developing a driving test which would serve all three of the following purposes:

1. To determine the driver's knowledge and ability with respect to safe practices of driving, public relations and the conservation of equipment.

2. To determine the driver's physical ability to use his knowledge of driving (eye sight, hearing, reflexes, reactions to emergencies, etc.).

3. To provide a basis for a course of driving instruction.

On the basis of the eight tests which have been given, points one and three above appear to be well covered by this test as will be seen in later examples. Point two, the determination of the driver's physical ability to operate an automobile can be partially covered during the road test by closely observing the driver's reactions to situations which develop along the way. A complete determination of this point, however, can only be made with the aid of special instruments which measure accurately the physical defects of the human body.

A system of scoring the tests was provided in order that a comparison between different types of drivers could be made and some form of a driving standard obtained. A tentative rating of the driver's ability based upon the score which is made in the test was decided upon as follows:

Good	—0 to —75
Fair	—75 to —125
Poor	—125 and up

This rating can be shaded up or down in accordance with the proximity of the score to the divisional point.

The results of the tests, score wise, which have been given to date are as follows:

1. —39	5. —74
2. —42	6. —81
3. —55	7. —124
4. —58	8. —144

An individual analysis of the tests which produced the low score of —39 and the high score of —144 is interesting and is carried through in the following paragraphs:

Case Number One—Score —39

Background: Female employee; age 43; 23 years driving experience; eighteen months of Company driving experience; formerly held position of driver with a mortuary firm; has the reputation among the other drivers in the group of being a very good driver; has experienced one minor accident in a Company car in eighteen months of driving.

Test Results: Test score of —39 indicates a better than average driver; greatest fault is failure to come to a full stop at boulevard stop signs; somewhat careless manner of giving arm signals.

Summary: It appears that this driver possesses both the know-how and the physical ability to drive as nearly perfect as could be expected. The unknown quantity in the case of this employee is the consistency or inconsistency of her mental attitude.

Follow-Up Action: The faults mentioned above were discussed with the employee. In my opinion, periodic reminders of a driver's responsibilities, both to himself and to others, would be helpful in maintaining an alertness in the mind of this driver.

Case Number Eight—Score —144

Background: Male employee; age 21; 2 years driving experience; recently discharged from the army for minor physical ailment; drove army equipment while in the service; no other driving experience; doesn't own personal car; new employee with the Company.

Test Results: Test score of —144 indicates a very poor driver. The test shows that this driver was guilty of speeding, improper use of horn, improper speeds in low and second gear, failure to give arm signal on emergency stops; improper speed in a school zone; cuts in and out of traffic lanes; was rough on brakes and clutch and handled his car in a very clumsy manner. In addition, this driver displayed a lack of anticipation in his driving and seemed unaware of other cars around him. He seemed to lack a dexterity of arm and leg movement.

Follow-Up Action: This employee was driven back over the test course the following day. The test was used as the basis for a complete course of instruction in driving. He was allowed several weeks in which to improve his driving and was then retested. In the second test he scored a —43 which reflects the improvemen in driving that was visibly

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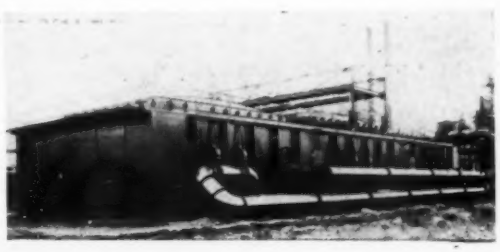

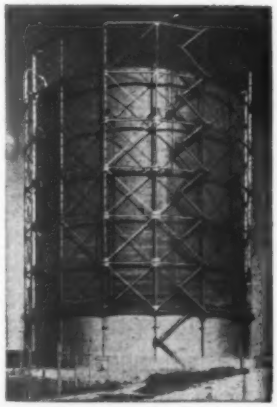

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noticeable in his handling of the car and in his knowledge and use of the principles of safe driving.

The results which were obtained in this case are very gratifying, inasmuch as it is a distinct improvement over our former method of training our drivers. It indicates that our employee's driving experience and knowledge can be accurately determined and his weak points greatly improved.

It is conceivable that in some cases which produce a test similar to the one discussed above, an immediate release of the employee, if probationary would be warranted. Each case, of course, will have to be judged upon its individual merits and the follow-up action tailored to meet the needs of the driver being tested.

There are naturally many intangible factors in a driving test such as this which need to be explored and properly evaluated. This can be done only as numerous tests are made and seores recorded and compared.

DRIVER CHECK LIST

Southern California Gas Company

Name ..... Score .....

Date .....

Car .....

Familiar with car .....

1. STARTING ENGINE			
(a) Depresses clutch pedal	(1)	.....	
(b) Checks gears for neutral	(2)	.....	
(c) Turns ignition switch	(1)	.....	
(d) Pushes starts correctly	(1)	.....	
(e) Allows motor to warm up	(3)	.....	
(f) Adjusts rear view mirror	(2)	.....	
2. STARTING IN GEAR			
(a) Checks traffic conditions	(2)	.....	
(b) Races the engine	(3)	.....	
(c) Starts roughly	(1)	.....	
(d) Clashes gears	(3)	.....	
(e) Proper gear	(3)	.....	
(f) Stalls engine	(2)	.....	
3. TURNING CHECKS			
(a) Makes turn from proper lane	(3)	.....	
(b) Enters correct lane after turn	(3)	.....	
(c) Exercises caution at intersection	(5)	.....	
(d) Turns too short	(1)	.....	
(e) Turns too wide	(1)	.....	
(f) Proper signal	(3)	.....	
4. TRAFFIC SIGNALS CHECK			
(a) Leaves car in neutral but rides clutch	(1)	.....	
(b) Ready to move when signal changes	(1)	.....	
(c) Starts moving ahead of signal change	(5)	.....	
(d) Tries to beat light	(5)	.....	
(e) Obeys traffic signs	(3)	.....	
(f) Stops at proper location	(5)	.....	
(g) Gives hand signal	(3)	.....	
5. RUNNING CHECKS			
(a) Makes proper hand signal when forced to stop suddenly	(3)	.....	
(b) Follows car ahead too closely	(2)	.....	
(c) Uses rear view mirror	(2)	.....	
(d) Cuts in and out of traffic lanes	(3)	.....	
(e) Checks traffic	(2)	.....	
(f) Courteous to drivers	(1)	.....	
(g) Proper speed in high gear	(3)	.....	
(h) Proper use of horn	(2)	.....	
(i) Keeps eyes on road	(2)	.....	
(j) Drives in proper lane	(3)	.....	
(k) Rides the clutch	(3)	.....	
(l) Coasts down grades	(3)	.....	
6. STOP STREETS			
(a) Comes to full stop	(5)	.....	
(b) Stops in wrong position	(3)	.....	
(c) Runs through stop	(5)	.....	
(d) Observes all traffic and gives stop signal	(5)	.....	
7. TYPE OF DRIVER			
(a) Uses clutch roughly	(1)	.....	
(b) Uses brakes roughly	(1)	.....	
(c) Overcautious	(2)	.....	
(d) Overconfident	(2)	.....	
(e) Handles car in a clumsy manner	(2)	.....	
8. HILL CHECK			
(a) Car rolls backward too far	(4)	.....	
(b) Proper selection of gear	(4)	.....	
(c) Stalls on hill	(3)	.....	
(d) Places gear in low	(2)	.....	
9. STREET PARKING			
(a) Unnecessary maneuvering	(1)	.....	
(b) Wheel strikes or scrapes curb	(3)	.....	
(c) Front or back car bumped	(3)	.....	
(d) Too far from curb	(2)	.....	
(e) Checks traffic	(4)	.....	
TOTAL		.....	

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Saving in Power Cost by Increased Efficiency

By
W. F. Schaphorst, M.E.
Newark, N. J.

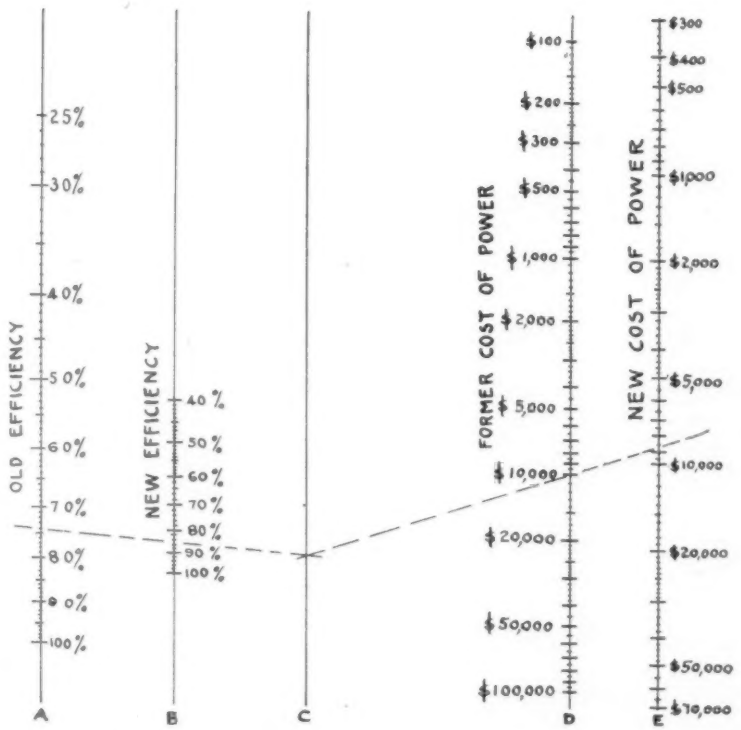
THIS CHART will be found useful for determining the savings that are possible by increasing efficiencies. This may be accomplished in two ways: by removing the old and inefficient machine and replacing it with one having a higher efficiency, or, by increasing the efficiency of the old machine, if possible.

To use the chart, zig zag two straight lines across as indicated by the dotted lines and the saving is found by subtracting the figure in column E from that in column D.

For example, let us say that your present compressor has an efficiency of 74 per cent and that it is proposed to install a new or improved compressor having an efficiency of 85 per cent. The cost of electric power at present is $10,000 per year. How much money will be saved by installing the compressor having the higher efficiency?

Run a line through the 74% in column A, and the 85% in column B, and locate the intersection with column C. Then from that point of intersection run through the $10,000 in column D and it will be found that the line cuts column E at $8,700. This means that the new compressor will operate at a cost of $8,700 per year for electric power as compared with the present cost of $10,000 per year. Subtracting $8,700 from $10,000 the saving therefore will amount to $1,300 per year.

There is no limit to the range of the chart as regards price or cost. Thus by simply adding ciphers to the figures in columns D and E the same dotted line tells us that if the former cost is $100,000 the new cost will be $87,000. Or if the former cost is $1,000,000 the new cost will be $870,000. And so on. And where the costs are less, simply subtract ciphers. Thus if the former cost is $10 per year three ciphers are removed from the figure in column D and we therefore also remove three ciphers from the figure in column E and the answer is $8.70. In other words, add as many ciphers to the figures in column E as you add to the figure in column D, or, if deducting, subtract as many ciphers from the figure in column E as you deduct from the figure in column D.



The chart emphasizes the money value of higher efficiencies. First cost, of course, must be given consideration as well as efficiency. Thus it may not pay to buy a compressor having the highest efficiency obtainable whereas it will pay well to install a standard compressor of reasonable price having an efficiency considerably higher than that of the old compressor. The example cited above—74% and 85%—is typical of improvements that are commonly and profitably made.

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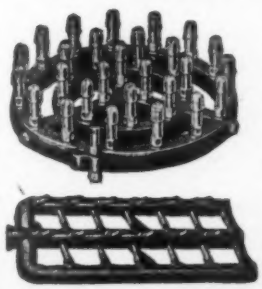

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Application of Diethylene Glycol-Water Solution for Dehydration of Natural Gas at 1000 Psig. Pressure

By

N. K. Senatoroff

Southern Counties Gas Company

THE use of liquid absorbents for dehydration of natural gases has been known to the gas industry for many years, and much engineering effort has been applied to perfecting the design of this type of dehydration plant. Numerous articles in technical literature have described in detail the successful application of liquid absorbents to the large volume and high operating pressure gas dehydration requirements of modern transmission line design. However, few engineering data have been published on the actual design of these plants, and there still appears to be ample room for improvement in the presently operating plants before they can be termed "perfect."

The first commercial dehydration plants using solutions of diethylene glycol were built in this country in the late thirties. Their original design was influenced, to a considerable extent, by the idea of possible reconversion to the calcium chloride absorbent in the event the glycol solution proved too expensive or otherwise unsatisfactory.

The DEG (Diethylene Glycol) absorbent has since proved to be a very satisfactory substitute for the calcium chloride solution, due primarily to the greater dew point depression obtainable with it, and to the absence of the danger of corrosive action by the absorbent under the most commonly encountered operating temperatures and/or pressures. During the last three or four years we have witnessed successful application of the DEG absorbent to the dehydration of natural gas at pressures in excess of 750 psig., and the application of the DEG solution to dehydration of natural gas at operating pressures in excess of 1000 psig. was first tried on the Pacific Coast this year in connection with operation of the recently completed Goleta-Ventura 16" Natural Gas Transmission Line.

This paper has been prepared with the idea of presenting some of the basic process engineer's computations pertaining to the design of water vapor absorption equipment, which might be of interest to those considering the use of the process, and to the men connected with the supervision and maintenance of these plants.

Water Vapor Absorption Equipment

Rigorous engineering design of absorption equipment in the present case was impossible because of the complete lack of data on the properties and behavior of DEG solution at 1000 psig. pressure, and the commonly accepted method of obtaining engineering and performance data by construction of a pilot plant was unthinkable because of time limitations imposed on the completion of the plant.

In view of these difficulties, it was finally decided to limit the design computations for the absorption equipment to purely theoretical studies of the effect of increased operating pressure on the important phases of the absorption process, taking, as a basis for the new equipment design computations, the original absorption equipment design of the old 400 psig. DEG dehydration plant. The justification for such an approach to the solution of the problem was found in the assumption

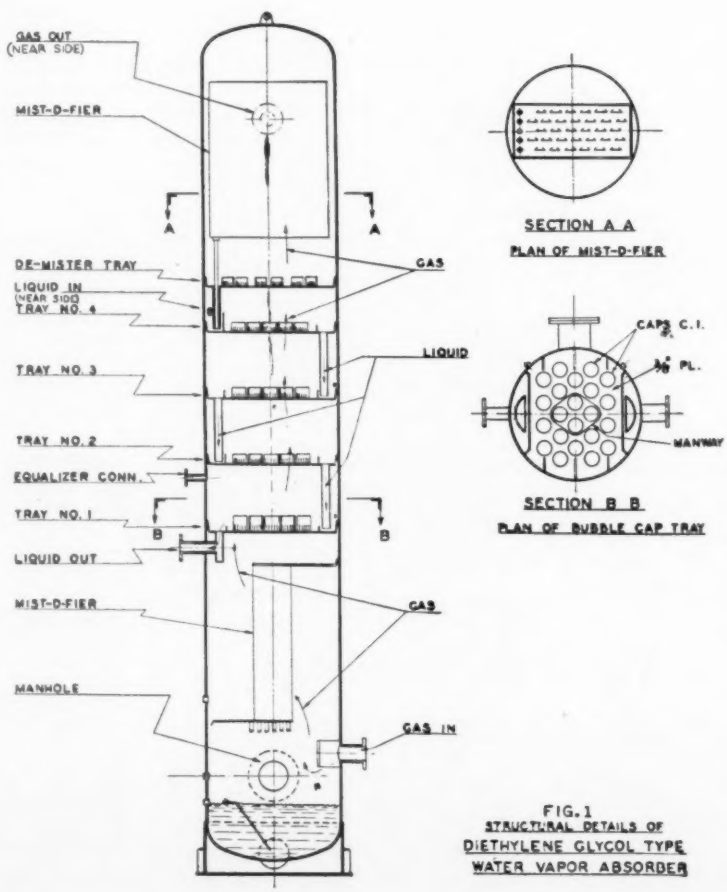

FIG. 1
STRUCTURAL DETAILS OF DIETHYLENE GLYCOL TYPE WATER VAPOR ABSORBER

Presented at meeting of Pacific Coast Gas. Assn. Fresno, Cal., March 28, 1945.

that many features of the design defy exact computation anyway, and engineering practice has frequently produced successful design of equipment even though the theoretical calculations were far from complete.

Selection of Absorber Type

In the selection of the absorption equipment, the bubble cap or the plate type tower absorber was preferred to the packed type tower for the same reasons which governed the selection of the 400 psig. absorber:

1. The bubble cap type tower gives more efficient gas-liquid contact than the packed type.
2. The bubble cap tower seldom presents difficulties from channeling of gas and liquid streams.
3. The bubble cap tower's total weight is considerably less than that of the packed tower. In regions subject to earthquakes, this factor acquires considerable importance.
4. The bubble cap tower, fitted with manways through the plates, can be cleaned and inspected at less cost than the packed tower.
5. Nearly all "modern" towers are of the bubble cap type.

Outline of Computations

In the few paragraphs which are to follow, we are presenting the important design computations that were made by the engineers of the Southern Counties Gas Company, in order to provide structural detail specifications, and a set of complete drawings for the manufacturers of the pressure vessel equipment to bid on the fabrication of an absorber, bubble cap type, for the dehydration of natural gas under the following operating conditions:

Pressure—Pounds Gage	
Gas into absorber	1000
Gas out of absorber	998
Temperature—Degrees F.	
Gas into absorber	70
Gas out of absorber	72
Dew Point Temperatures—Degrees F.	
Gas into absorber	70
Gas out of absorber	30

General Data

Gas volume treated
50 M²cf. per day

Specific gravity of DEG-water solution
into absorber 1.117 (95% by wt. DEG—5% by wt. water)
out of absorber 1.115 (90% by wt. DEG—10% by wt. water)
(See Figure 2.)

Temperature of DEG—water solution—Degrees F.	
into absorber	70
out of absorber	72

Circulation rate of DEG—water solution
5-10 gallons per minute, or
300-600 gallons per hour, or
144-288 gallons per 1 M²cf. of gas treated

In a design project of this kind, many figures dealing with the physical properties of the materials involved in the process are used over and over again in the computations. Delay and confusion have been avoided by deriving and compiling these figures in a separate paragraph at the start of the work.

Since the laws of ideal gases and solutions are not applicable to the natural gas and DEG streams at higher pressures with an accuracy sufficient for engineering calculations, quantitative relationship among compositions, water vapor contents, velocities, densities, pressures, viscosities, weights and other often used properties of natural gas and of the liquid absorbent had to be computed for frequent reference.

The P-V-T Relationship of Paraffin Hydrocarbons of the Average Molecular Weight of Natural Gas Mixtures

Gas Analyses—Goleta-Ventura Fields (Combustion Method) — Typical range of composition—per cent by volume:

Carbon Dioxide	CO_2	0.1	0.4
Methane	CH_4	76.0	84.5
Ethane	C_2H_6	22.9	13.0
Oxygen	O_2	none	0.5
Nitrogen	N_2	1.0	1.6

Range of Molecular Weights of the Gas

	Mol. Fraction	*Mol. Wt.*
CO_2	$0.001 \times 44.01 =$	0.044
CH_4	$0.760 \times 16.04 =$	12.190
C_2H_6	$0.229 \times 30.07 =$	6.886
O_2	$0.000 \times 32.00 =$	0.000
N_2	$0.010 \times 28.02 =$	0.280
	1.000	= 19.400

Mol. Fraction	*Mol. Wt.*
$0.004 \times 44.01 =$	0.176
$0.845 \times 16.04 =$	13.554
$0.130 \times 20.07 =$	3.909
$0.005 \times 32.00 =$	0.160
$0.016 \times 28.02 =$	0.448
1.000	= 18.247

The average mol. wt. of the gas mixture $= \dfrac{19.400 + 18.247}{2} =$ 18.824

The average specific gravity (air = 1.0) $\dfrac{18.824}{28.966} = 0.650$

The application of the pseudo-critical method to calculations of the deviation factor for natural gas is

best illustrated by the following examples:

PROBLEM 1—Calculate the volume at standard conditions (14.73 psi. abs. and 60°F.) that would be occupied by the gas contained in 1 cu. ft. of space at pressure of 1014.73 psi. abs. and 70°F. (average analysis of the gas is given in the following tabulation):

A Component (Average)	Mol. Fraction	B Critical T of Abs.	C Critical P lb. sq. in. Abs.	D AxB	E AxC
Carbon Dioxide	$\frac{0.001 + 0.004}{2} = 0.002$	549	1072	1.098	2.144
Methane	$\frac{0.760 + 0.845}{2} = 0.803$	344	673	276.232	540.419
Ethane	$\frac{0.229 + 0.130}{2} = 0.180$	550	712	99.000	128.160
Oxygen	$\frac{0.000 + 0.005}{2} = 0.002$	278	730	0.556	1.460
Nitrogen	$\frac{0.010 + 0.016}{2} = 0.013$	227	492	2.951	6.396
	= 1.000			379.837	678.579

Tc—Pseudocritical temperature = 379.84°F. abs.

Pc—Pseudocritical pressure = 678.58 psi. abs.

Tr—Reduced temperature $= \frac{(460° + 70°)}{379.837} = \frac{530°\text{F. abs.}}{379.837} = 1.395$

Pr—Reduced pressure $= \frac{1014.73 \text{ psi. abs.}}{678.579} = 1.495$

The compressibility factor Z was obtained from published work on "Deviations of Natural Gas from Ideal Gas Laws," by George Granger Brown, Consulting Engineer and Professor of Chemical Engineering, University of Michigan.

$Z = 0.825 \quad (Y = \frac{1}{Z} = 1.2125)$

Therefore, the given gas at standard conditions would occupy a volume of:

$$V_0 = \frac{1014.73 \text{ psi. abs.} \times 1 \times (460°\text{F.} + 60°\text{F.})}{(460°\text{F.} + 70°\text{F.}) \times (14.73 \text{ psi. abs.})} \times \frac{1}{0.825} = 81.93 \text{ cu. ft.}$$

Not considering "deviation," the result would have been:

$$V_1 = \frac{1014.73 \text{ psi. abs.} \times 1 \times (460°\text{F.} + 60°\text{F.})}{(460°\text{F.} + 70°\text{F.}) \times (14.73 \text{ psi. abs.})} = 67.59 \text{ cu. ft.}$$

Not considering the deviation, the error in computing volume flow through the absorber would have been 17.5% low.

PROBLEM 2—Calculate the volume at standard conditions (14.73 psi. abs. and 60°F.) that would be occupied by the gas contained in 1 cu. ft. of space at pressure of 414.73 psi. abs. and 70°F. (average analysis of the natural gas mixture being the same).

For the purpose of comparison of the two methods of computation, we are using Mr. R. V. Dunkle's article on "Deviation of Natural Gas from Boyle's Law," P.C.G.A. Proceedings, 1944, to arrive at the following pseudocritical temperatures and pressures:

Basis of calculations:

Specific gravity (S), Carbon Dioxide Fraction (C), and the heating value of the gas mixture (H).

Average mol. weight of the gas = 18.824 lbs. (See above)

Average specific gravity (air = 1.0) = 0.650

Average heating value (Btu./cu. ft. — dry) =

Methane value $\frac{(0.760 + 0.845) \times 1015}{2} = 815.05$

Ethane value $\frac{(0.227 + 0.130) \times 1795}{2} = \frac{321.30}{1136.35}$

Average Carbon Dioxide mol. fraction = 0.0025

Tc—Pseudocritical temperature = 128.5 + 90.1(S) + 0.1632(H) + 244(C) = 373.2°F. abs.

Pc—Pseudocritical pressure = 670.7 — 183.9(S) + 0.1028(H) + 683(C) = 669.7 psi. abs.

Tr—Reduced temperature $= \frac{70°\text{F.} + 460°\text{F.}}{373.2°\text{F.}} = 1.420$

Pr—Reduced pressure $= \frac{400 \text{ psig.}}{669.7 \text{ psig.}} = 0.597$

$Y_{400} = \frac{1}{Z} = 1.072$

Therefore, the given gas at standard conditions would occupy a volume as shown in equation below.

$$V_0 = \frac{414.73 \text{ psi. abs.} \times 1 \times (460°\text{F.} + 60°\text{F.})}{(460°\text{F.} + 70°\text{F.}) \times (14.73 \text{ psi. abs.})} \times 1.072 = 29.61 \text{ cu. ft.}$$

$$V_1 = \frac{414.73 \text{ psi. abs.} \times 1 \times (460°\text{F.} + 60°\text{F.})}{(460°\text{F.} + 70°\text{F.}) \times (14.73 \text{ psi. abs.})} = 27.62 \text{ cu. ft.}$$

The volumetric error in the case of the 400 psig. pressure would amount to 7.05%.

Density of the gas/1 cu. ft. = 0.0765 × 0.650 × 1.00 = 0.0497 lbs.

Density of the gas/1 cu. ft. of space @ 400 psig. = 0.0765 × 0.650 × 29.61 cu. ft. = 1.472 lbs.

Density of the gas/1 cu. ft. of space @ 1000 psig. = 0.0765 × 0.650 × 81.93 cu. ft. = 4.072 lbs.

Diameter of Absorber

The bubble cap tower is designed to give the most efficient countercurrent contact between the liquid absorbent and the gas, and to limit the amount of absorbent used, per unit of gas treated, to the lowest possible quantity adequate to dissolve the desired constituent. In so doing, an intimate contact is necessary, but too high a gas velocity results in entrainment and consequent losses of an expensive DEG solution.

Entrainment is governed by several factors, some of which are: superficial velocity of the gas stream, density of the gas, density of the liquid absorbent and the structural design of the bubble cap plates. These factors are related to one another as shown in the following equation:

$W = C\sqrt{d_2\ (d_1 - d_2)}$ (See "Fractionating Columns," Ref. Nat. Gas Mfg., Jan. 1934.

Where W = mass velocity, lbs. per sq. ft. per hr.
d_1 = density of liquid, lbs. per cu. ft. (at tower temp.)
d_2 = density of natural gas stream, lbs. per cu. ft. (at tower cond.)
C = a constant

The value of the constant C is dependent on the tray spacing, the properties of the liquid, and the construction of the bubble cap plate.

In order to use the foregoing equation, it is necessary to determine the value of C experimentally, or from a curve—Figure 3. (Dr. G. G. Brown & Ind. Eng. Chem.), or from the operating data of identically designed equipment. We estimated the value of C from performance of the 400 psig. bubble cap absorption tower as follows:

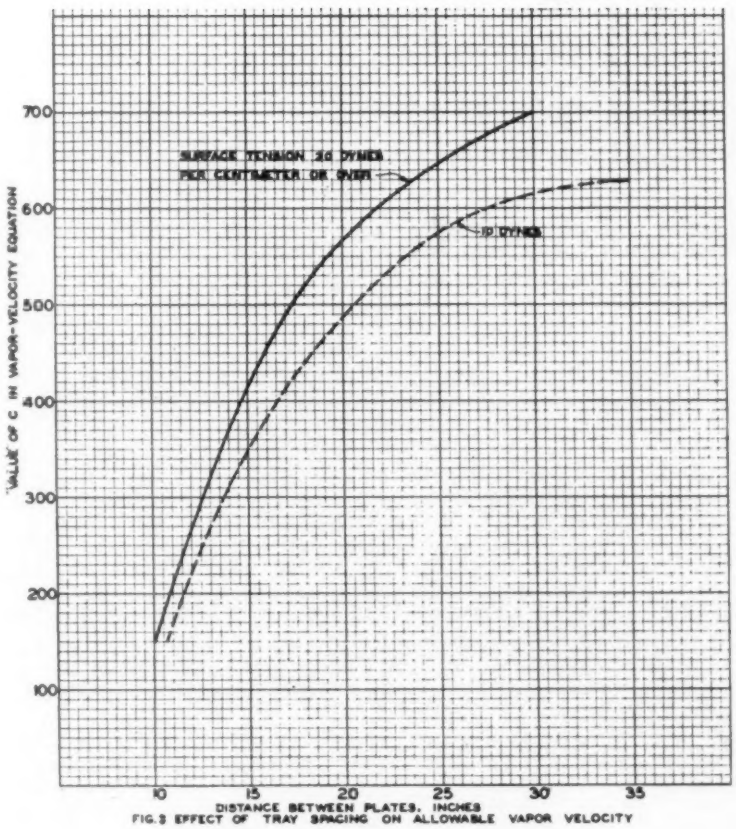

FIG. 3 EFFECT OF TRAY SPACING ON ALLOWABLE VAPOR VELOCITY

Capacity of the 400 psig. absorber (max.) had been established to be equal to 30 M³cf./day

Cross Sectional Area of 48" O.D. absorber in sq. ft. =

$$\frac{\pi \times (ID'')^2}{4} = 0.785 \times \left(\frac{48'' - 2''}{12''}\right)^2 = 11.534 \text{ sq. ft.}$$

Specific Gravity of the gas = 0.650 (air = 1.0)

d_1 = *density of DEG (90%)* = Sp. gravity solution × density of water = 1.115 × 62.2614 = 69.422 lbs./cu. ft.

d_2 = *density of gas* = 1.472 lbs./cu. ft.

$$\text{Mass velocity, } W = \frac{30{,}000{,}000 \text{ cu. ft.} \times 0.0765 \times 0.650}{11.534 \text{ sq. ft.} \times 24 \text{ hrs.}} = 5386$$

$$\text{Therefore, } C = \frac{W}{\sqrt{d_2(d_1 - d_2)}} = \frac{5386}{\sqrt{1.472\ (69.422 - 1.472)}}$$

$$= \frac{5386}{\sqrt{100.0224}} = 538.5$$

After having determined the value of C, the diameter of the 1000 psig. absorber is calculated as follows:

$W_{1000} = \sqrt{d_2(d_1 - d_2)}$ where
d_1 = density of DEG (90%), same as above = 69.422 lbs./cu. ft.
d_2 = density of gas = 4.072 lbs./cu. ft.

$$W_{1000} = 538.5\sqrt{4.072\ (69.422 - 4.072)}$$
$$= 538.5\sqrt{4.072 \times 65.350}$$
$$= 538.5\sqrt{266.105}$$
$$= 538.5 \times 16.313 = 8784.55$$

The designed capacity of the absorber to handle 50 M³cf./day, in terms of the weight load in lbs., is equal to:

$$\frac{50{,}000{,}000 \text{ cu. ft.} \times 0.0765 \times 0.650}{24 \text{ hrs.}}$$

$$= 50{,}000 \times 2.071 = 103{,}550 \text{ lbs.}$$

Thus, the cross-sectional area of the absorber is determined to be $\frac{103{,}550 \text{ lbs.}}{8784.55} = 11.788$ sq. ft. and $(\text{Diameter})^2 = \frac{\text{Area}}{\frac{\pi}{4}} = \frac{11.788}{0.785}$

= 15.016 sq. ft.

Diameter = $\sqrt{15.016} = 3.875$ ft.
3.875 × 12" = 46.5" I.D.

The actually designed absorber diameter was increased to 50" I.D. in order to take care of unforeseen contingencies that might occur in the operation of the dehydration plant.

Part II will appear in the October issue

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RECENT COURT DECISIONS
Affecting Gas Utilities

Workmen's Compensation Laws Protect Gas Company Employes

By
Leo T. Parker
Attorney at Law
Cincinnati, Ohio

A MAJORITY of gas company officials believe that when the required premiums are paid into the Sate Workmen's Compensation fund all common law liabilities are eliminated. However, this assumption is erroneous, as we shall prove by the latest and modern higher court decisions on this subject of law.

First, it is important to know that under the old, or common law, all gas companies stood liable to pay heavy damages to injured employes. Of course, under these *old* laws no employe could recover damages for an injury unless the testimony conclusively proved that the injury resulted from *negligence* on the part of the employer. Therefore, if the injury was caused by failure of the employe to use *ordinary care* to safeguard *himself* from the injury, the employe could *not* recover damages, or other compensation. Thus negligent employes received *no* compensation while recuperating from injuries, although sustained within the scope of the employment.

However, modern Workmen's State Compensation Laws enable gas company employes to receive payments of compensation for injuries sustained "in the course of the employment," *irrespective* of the fact that the injury resulted from negligence of either the employer or the employe.

Obviously, an important advantage of these modern compensation laws is that an injured employe is assured payment of reasonable and adequate compensation, during the period he is unable to perform services, and in direct consideration of the seriousness of the injury. Also, all employers are presumed to be relieved from payment of damages to injured employes, although, as we shall prove later in this discussion, this is not always a dependable assumption. Actually, the present circumstances are numerous under which gas companies still, under the modern compensation laws, may be compelled to pay heavy damages to injured employes.

Employment Illegal

Modern higher courts hold that the noncompliance of a gas company with a state law prohibiting employment of children under sixteen renders the employment illegal. Therefore, employers who wilfully violate the law automatically forfeit their rights under policies of insurance against suits by insured employes.

For instance, in Ocean v. Peoples, 29 Atl. (2d) 418, it was shown that a boy 15 years old was injured. The employer carried industrial insurance against damage suits by injured employes.

In view of the fact that the employer had failed to comply with a state law requiring employers of persons under sixteen years old to file certificates with the truant officer, the higher court held the insurance policy void as to the employer.

Infant Misstates Age

Frequently gas companies whose officials are reasonably careful may nevertheless violate a state law which forbids employing infants. Usually the company may avoid payment of damages or compensation if the evidence proves that the infant misstated or falsely represented his age.

For instance, in Caldwell Company v. Jarvis, 185 S. W. (2d) 552, reported May, 1945, it was shown that a state law forbids the employment of an infant under sixteen years of age. A boy had the appearance of an eighteen year old boy and represented himself to be of that age at the time he solicited employment, although he lacked two months and ten days of being sixteen. Later the boy was killed and his mother sued for damages.

The lower court held the company liable but the higher court reversed the verdict because there was no *wilful* violation of the state law.

Another important point of law, decided by this court, involved failure of the company to obtain an age certificate from the boy. This court held that the failure of the company to procure an age certificate, required by a state law, simply gave the employe, or his dependents the right to sue for damages. This court also held that if the employer *unintentionally* failed to obtain an age certificate the employe must accept compensation under the State Workmen's Compensation Act.

Beware of Minors

A common source of liability arises where minors are employed without consent of their parents.

For illustration, in the case of Ball v. Stroub Company, 10 So. (2d) 532, reported January, 1945, it was shown that a company employed a 15-year-old boy without obtaining consent of his parents. The boy sustained severe injuries and his parents sued for damages.

This higher court laid down new law to the effect that an employer is not liable for injuries to a minor employe *if* the evidence *proves* that the minor's parents either had given their consent to the employment, or *by their conduct* impliedly consented to the employment.

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However, in order to certainly avoid legal complications, all gas company officials who employ minors should obtain a *written* consent from the parents.

Physicians Testify

Two important sources of testimony usually convince a court of the actual injuries suffered by an employe. One source is physicians, and the other is past records of similar injuries.

For example, in Johnson v. Southern Natural Gas Company, 18 So. (2d) 348, reported July, 1944, it was shown that a gas company employe was seriously injured when struck on the head with a pipe. He sued to recover compensation under the State Workmen's Compensation Act for "permanent" injuries. During the trial he testified that he "hurts all the time" in the back, neck, head and "skull"; that the middle of the back hurts everytime he makes a step. The X-ray pictures disclosed a skull fracture.

However, the court considered the testimony of all physicians and was convinced that the employe's injuries were not permanent. Therefore, the higher court refused to grant compensation on the basis of permanent disability.

Employe Injured While Playing

Generally speaking, an employe who is injured while acting outside the scope of his employment, as playing games, is *not* entitled to compensation under the State Workmen's Compensation Laws.

For instance, in Eagle Company v. Davison, 132 Pac. (2d) 937, reported January, 1945, it was disclosed that an employe found a dynamite cap and began playing with it and amusing himself by striking the cap against objects and by attempting to frighten his fellow employes by pretending that he was going to touch a match to the cap. While so amusing himself with the cap it exploded in his hand causing severe injury to his left hand.

The injured employe filed a claim for compensation on account of disability which resulted from the injury.

Although the Industrial Commission awarded the employe compensation, the higher court reversed the verdict, saying:

"An injury sustained as the result of play indulged in by an employe for his own amusement does not arise out of the employment and any disability resulting therefrom is not compensable."

Employe Dies from Injury

Considerable discussion has arisen from time to time over the legal question: If an employe of a gas company is killed, may his dependents receive death benefit compensation?

The answer to this question is: (1) When according to a jury the injury was received in the course of, and arising out of, the injured employe's employment.

For example, in Maynard v. Goodrich, 56 N. E. (2d) 195, reported September, 1944, it was shown that an employe sustained an injury. Later the employe died and his dependents sued to recover compensation. After listening to the testimony the jury decided that streptococci fostered by the culture medium entered the blood stream and caused total breaking up of the employe's heart's action and death.

The employer appealed to the higher court which, however, held the dependents entitled to a favorable verdict. This higher court said:

"The question whether the injury was the proximate cause of death was for the determination of the jury."

Each Employer Responsible

Considerable discussion has arisen from time to time over the legal question: When an accident occurs and employes of two different employers are killed or injured who is responsible for payment of compensation?

For illustration, in Department of Labor, 156 Pac. (2d) 640, reported April, 1945, it was shown that two employers carried compensation insurance. By an accident employes of both employers were killed.

The higher court held that each employer is liable under the State Workmen's Compensation Act for payment of compensation to his own employes.

Must Prove Injury

Modern higher courts have adopted a dependable rule for determining whether an employe was "in the course of his employment" when he sustained an injury. This rule is that an employe who sues to recover state compensation is bound to *prove* that he was injured while working for the gas company. Otherwise the court will *not* award compensation.

For illustration, in Lee v. Memphis Natural Gas Company, 197 So. 639, the testimony showed: An employe of a gas company filed a suit for compensation under the State Workmen's Compensation Act and testified that he slipped and fell seriously injurying his back and spine while doing his regular work.

The counsel for the gas company contended that the employe did not receive any injury within the scope of his employment. Since the employe failed, to prove by other workmen, that he had received the injury while doing his regular work, the higher court refused to allow compensation.

Working Place

Modern higher courts consistently hold that if an injury is sustained in the employe's "working place," he is entitled to recover compensation under the State Workmen's Compensation Act. Generally speaking, a "working place" is limited to a special room in a building, including passage way to and from this room. On the other hand, the working place can be considerably extended under special circumstances.

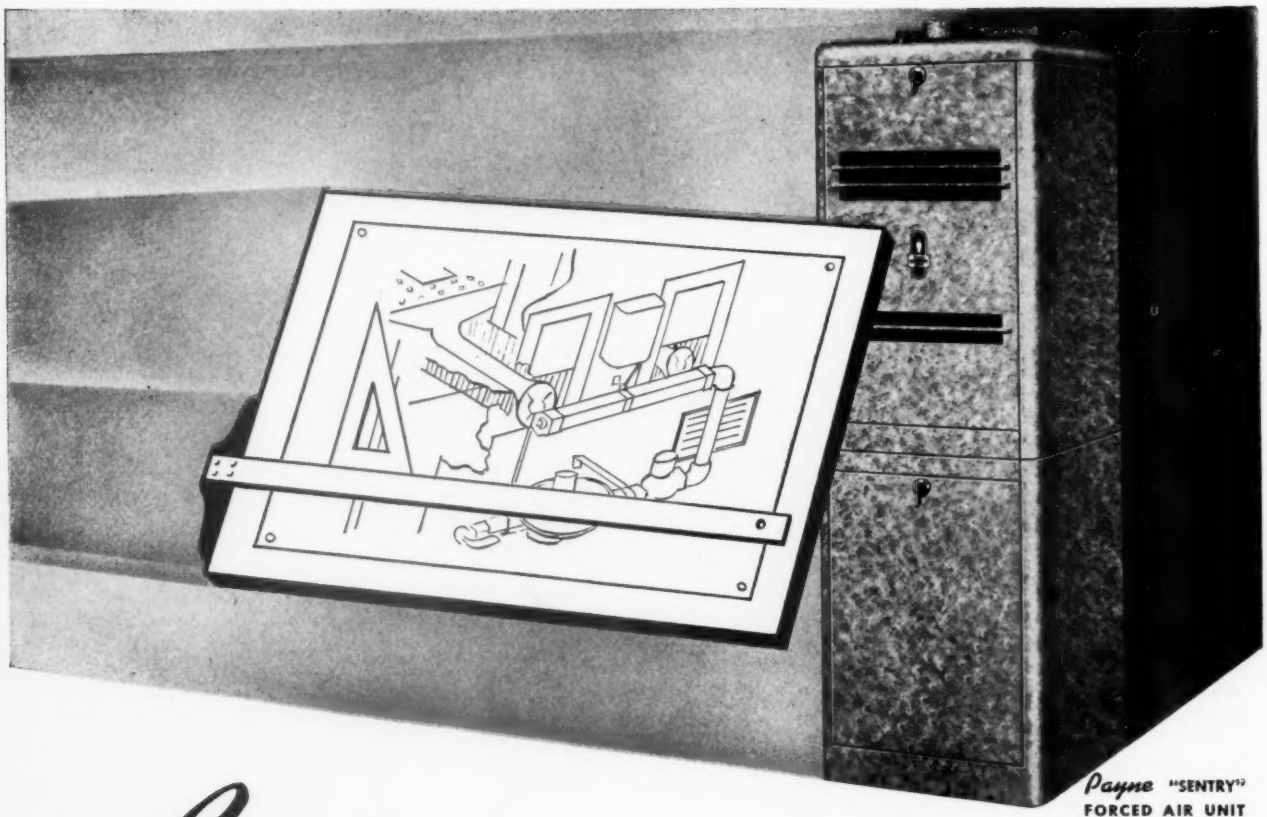
For example, in Souza's Case, 55 N. E. (2d) 611, reported August, 1944, it was shown that an employe lost his life in a fire while asleep in a rooming house where he was spending the night.

The question presented the higher court was whether the employe's dependents were entitled to recover compensation under the State Workmen's Compensation Act.

The facts are as follows: The employe was employed as a "service man." His work called him to various places and required him from time to time to be away from home nights. He was required to work whenever he was called upon. In any emergency, whether during or after regular hours, he was expected to put in as much of his time and attention as in his judgment the situation required.

In view of this testimony the higher court held the employe's dependents entitled to receive payments of compensation under the State Workmen's Compensation Act. The court held that the employe was within the scope of his employment when he was burned to death in the lodging house. This court said:

"In such cases the inquiry has been whether his employment exposed him to the risk, whatever it was, which actually caused the injury. . . . In our opinion the deceased employe, while as an incident of his employment he was asleep subject to call in a place paid for by his em-



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ployer and selected according to the conditions imposed by the nature of the employment, met injury and death arising out of and in the course of his employment."

Therefore, this modern decision establishes law that an employe, in order to be entitled to compensation, need not necessarily be engaged in the actual performance of work at the moment of injury. It is enough if he is occupying himself consistently with his contract of hire in some manner pertaining to or incidental to his employment.

Salesman Sustains Injury

Modern higher courts consistently hold that a salesman employed by a gas company may recover either damages or compensation under the State Workmen's Compensation Act, if he sustains injuries while acting within the scope of the employment. The jury must decide this question after listening to relevant testimony.

Take for example the case of Green v. Texas Employers Ins., 168 S. W. (2d) 694, reported January, 1945, in which a salesman was injured while assisting a customer.

The lower court refused to allow the salesman compensation for the injury under the State Workmen's Compensation Act. However, the higher court reversed the verdict, saying:

". . . We are of the opinion that these issues should have been submitted to the jury."

Also, see Walsh v. Central Company, 58 N. E. (2d) 325, reported April, 1945, where a salesman was seriously injured while walking on a sidewalk on his way to call on a customer. A series of violent explosions occurred in a nearby warehouse which caused its walls to collapse affecting the injury. Both the company employer of the salesman, and the warehouseman carried Workmen's Compensation Insurance.

This court held that if the employe was injured within the scope of his employment he could *not* sue the warehouseman for damages, because he could get adequate compensation from the Industrial Commission.

Also, see Hartford v. Thornton, 31 S. E. (2d) 115, reported September. 1944, where it was shown that a salesman employed sustained serious injuries, from which he died. His dependents sued to recover compensation under the State Workmen's Compensation Act.

During the trial the testimony proved that the salesman was injured when he fell on slippery street while returning to the hotel, at which he was staying, from a cafe where he had his evening meal. The court held that the injury was not compensable "arising out of and in course of employment." This court said:

"The deceased was injured crossing a street in returning to the hotel from a mission which had no causal connection between the employment and the injury."

Scope of Employment

All legal authorities readily admit that the greatest chances of financial losses to gas corporations, from injuries to employes, arise from character of work being done, and whether the employe was within the scope of the employment when the accident occurred.

Therefore, we shall review a plurality of higher court decisions which clearly illustrate various phases of the law on this special subject of law.

(Concluded next issue)

Method of Refunding of Excess Charges Collected by Gas Distributing Company

By

John Simpson

The Supreme Court of the United States holds that the Circuit Court of Appeals has no jurisdiction to order the distribution, to municipal officials on behalf of the ultimate consumers of natural gas sold to them by distributors who buy from the producing company, of the fund which represents the excess of the gas rate collected by the distributing companies during the stay, pendente lite, of the Federal Power Commission's rate reduction order, under the Natural Gas Act, affecting the producing company. The Federal Court, the Supreme Court holds, has no jurisdiction to determine the ultimate consumers' rights. That is a State function.

The Federal Power Commission, acting under the Natural Gas Act, ordered the Natural Gas Pipeline Company of America to cut its rate so as to effect an annual reduction of not less than $3,750,000 in its revenues, effective September 1, 1940. Central States Electric Company, an Iowa public utility, buys gas at wholesale from the Pipeline Company and distributes it in Iowa. The Seventh Circuit Court of Appeals, at the instance of Pipeline, set the Commission's order aside. The Supreme Court reversed this judgment and sustained the order (Federal Power Commission v. Natural Gas Pipeline Co., 315 U. S. 575). When this was done Pipeline became liable to make refunds in accordance with the bond which it had filed at the beginning of its action. The court below, before payment of the amount due under the bond, filed an opinion holding that it was its duty to take exclusive control over the refund when made and to determine the rights of all claimants in the fund and made an order enjoining all claimants to the fund from further proceedings in any other court. This was done on Pipeline's petition that other suits were being filed against it in other courts by the ultimate consumers of the gas sold by Pipeline to the local distributing companies.

The Illinois Commerce Commission in its answer in that proceeding, stated that the rates charged by distributing companies in Illinois, were fixed by it and reflected the prices paid by distributors to Pipeline, and that the refund, representing excessive rates paid by distributors, had been collected from the ultimate consumers and was equitably due them. The Illinois local distributors agreed that the refund should be paid to the ultimate consumers. The Central States Electric Co. requested that the portion of the refund representing excessive rates paid by them during the refund period should be repaid to it and not to the ultimate consumers. The court found that since the rates charged to ultimate consumers included the excess charges paid by distributors to Pipeline, the ultimate

consumers were in equity entitled to receive the refund. Pipeline paid the excess refund into court, which determined that it belonged to the ultimate consumers, and allocated it to the customers of the local distributors, including Central's customers, to whom there was allocated over $25,000. Central claimed the fund, claiming it was the only party in privity with Pipeline. It also attacked the jurisdiction of the court to award the sum to Central's ultimate consumers, since such an award amounted to a retroactive reduction of local rates to which the Natural Gas Act by its express terms, did not apply. The court denied Central's petition without hearing or argument.

The Supreme Court's Opinion

The Supreme Court now reverses the judgment of the Circuit Court of Appeals for the following reasons, stated in its opinion, delivered by Mr. Justice Roberts:

"The court below was right in its view that as a federal court it had no power, at least in the absence of federal legislation purporting to confer such power upon it, to fix or adjust Central's rates, that being a legislative function of the State of Iowa. This would be so where the fund in dispute came into its possession in a proceeding to enjoin the operation of an order affecting state rates, and must be equally true where the proceeding was one to enjoin collection of a rate for interstate service. This, because the court below had no power as a court of equity to fix the rates, and as a federal court had no power to adjudicate a matter within the legislative competence of Iowa. The court below so held in this case, and has dealt with the matter more fully and to the same effect in another (Natural Gas Pipeline Co. v. Federal Power Commission, 141 Fed. 27).

"The Natural Gas Act clearly discloses that, though its purpose may have been to protect the ultimate consumer at retail, the means adopted was limited to the regulation of sales in interstate commerce at wholesale, leaving to the states the function of regulating the intrastate distribution and sale of the commodity. That Congress intended to leave intrastate transactions to state regulation is clear, not only from the language of the Act, but from the exceptionally explicit legislative record and from this Court's decisions.

"The showing made by the petitioner's pleadings, and not denied, is that in Iowa rates are set by municipal ordinance; that the rates collected from consumers during the refund period were the lawful rates so fixed; and that the sums impounded were deducted from the payments to Pipeline by Central out of its own funds . . . We are of opinion that the court below lacked jurisdiction to adjudicate the question of the consumers' right to the fund in dispute. . . .

"The ultimate consumers' rights being such as the law of Iowa affords, there is no reason for the payment of the fund to municipalities or municipal officers under a quasi trust for those found ultimately entitled, thus placing the burden on Central to pursue the cities or their officers for its recovery. An order to this effect is certainly not within the court's jurisdiction as a federal court of equity. The most the court below should do, in view of the apparent controversy as to the consumers' right to a refund of rates heretofore paid to Central, is to order that the fund be held for a reasonable time to permit interested persons to litigate the issue in a tribunal having jurisdiction, the order to be conditional that if such litigation is not instituted within a reasonable time, and prosecuted to final adjudication, the fund shall be paid over to Central, and that if it be adjudged, as a result of such litigation, that Central is indebted to its consumers because of the reduction of wholesale rates in this proceeding, further application may be made to the court as to its disposition."

Dissenting Opinions

Four judges dissented, with two dissenting opinions, one by Justice Black, in which Justice Murphy and Justice Rutledge concurred, and the other by Justice Douglas. The salient points of Justice Black's dissenting opinion appear in the following paragraphs thereof:

"The primary purpose of Congress in passing the Natural Gas Act was to protect ultimate consumers of gas from excessive prices. The court's decision today defeats that Congressional purpose, for under its interpretation of the Act the petitioner, a retail gas distributor, is awarded a windfall at the expense of the very consumers the Act was designed to protect.

"The court below refused to construe the Natural Gas Act so as to make this petitioner 'the beneficiary of a windfall to which it intends to hold on, once it can get possession of it.'

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benefits from a federal rate reduction in two ways: (1) by using the order to get reduced rates before their regulatory bodies; (2) by the impounding of funds for their benefit if a judicial stay of the federal reduction order is granted. The stay deprived these local consumers of a chance to use the Commission's order to obtain a local rate reduction. The holding of this Court partially, if not completely, deprives them of the benefit of the impounded funds. Cf. First National Bank v. Flershem, 200 U. S. 504,520.

". . . Petitioner admits that Iowa law requires the wholesale cost of gas to be one of the factors to be considered in determining the reasonableness of rates. The petitioner's rates must therefore be considered reasonable on the basis of the old wholesale price of gas, and any increment above those rates is a 'windfall.'

"If my previous analysis is correct, the rule announced by the Court today means simply this: So long as litigation can be kept pending in the courts as to the validity of a Federal Power rate reduction order, the benefits of the Natural Gas Act will be suspended as to ultimate consumers, and will be largely, if not exclusively, restricted to retail distributors. Thus, by a strange quirk of statutory construction, the effort of Congress to protect customers from excessive rates is transformed, where litigation is pending, into an Act which exploits consumers and unjustly enriches distributing companies. This Company has already received reasonable compensation for its services. It is entitled to no more under Iowa or Federal law."

Justice Black pointed out that $6,377,913.57 had been paid into the court by the Pipeline Company, the amount it had collected, pending this litigation, from Illinois, Nebraska and Iowa gas distributing companies, in excess of the rates fixed by the Commission; and that the Pipeline Company and all the distributing companies except the Central States Electric Co. and one small company in Nebraska (which subsequently settled with its consumers by turning over to them approximately 70% of the funds allocable to its purchases) acquiesced in the holding of the court below that the funds thus impounded properly belonged to the ultimate consumers, and should be refunded to them. And all of this amount, except for the $25,708.54 now ordered by the Supreme Court to be paid to the Central States Electric Co., had been distributed to the ultimate consumers.

Justice Douglas, in his separate dissenting opinion, said: "I think that the claims to the fund in possession of the court below are to be determined by State law. The Federal Power Commission has no authority to determine the rates which petitioner may charge to these Iowa cities. Under the Natural Gas Act that is for Iowa and Iowa alone to determine. . . . But the Federal Court which has this fund has considerable discretion in its management. . . .

"Petitioner is adequately protected by the decree entered in the court below. That court did not undertake finally to determine the rights to the parties to the fund. It has turned the fund over to respondents (Iowa municipal authorities) without prejudice to petitioner's rights in it. These rights are determined under Iowa law. That procedure does not preclude petitioner from its day in an Iowa court if its claim to the fund turns out to be less frivolous and more substantial than it appears to be. I think the court below selected the most equitable and just method of rectifying the injury by the stay order." Central States Electric Co. v. City of Muscatine et al., 324 U.S. 138.

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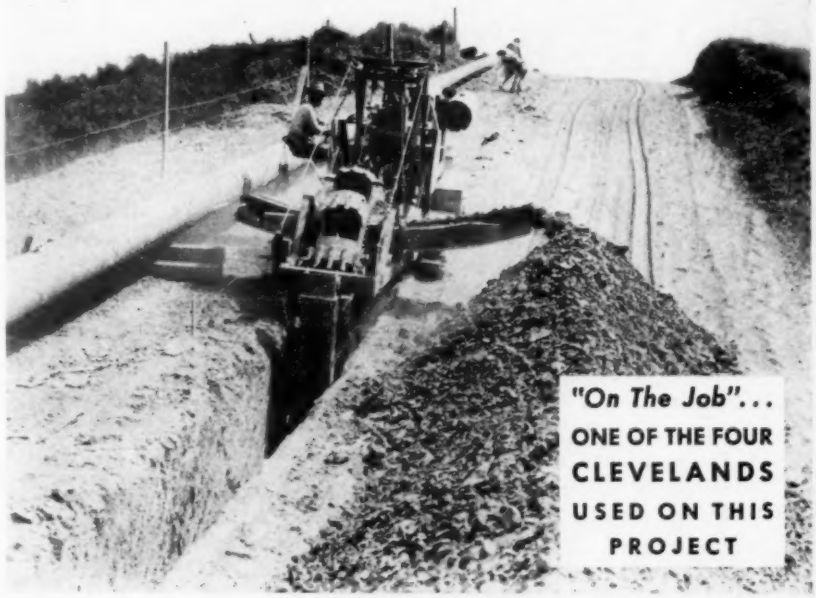

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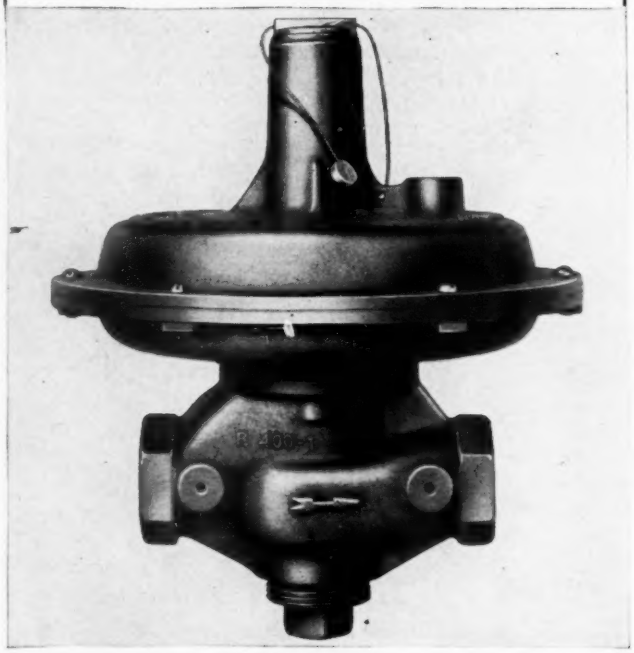

In the Low Pressure Field, where sensitive regulation is so essential, REYNOLDS offer extreme accuracy—the ability to keep small volume delivery pressure uniform, even if the line pressure varies. REYNOLDS Regulators are precision-built and delicately balanced for accuracy. All Reynolds Regulators give 100% operating performance—they are rugged, long lived and sensitive.

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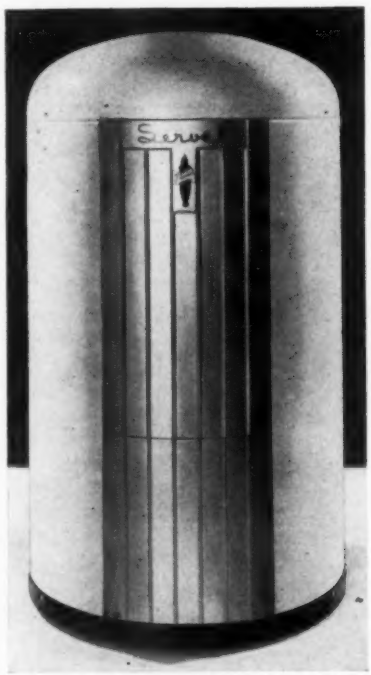
New Equipment and Appliances

Servel Water Heater

As soon as manufacturing facilities now devoted to war production are available, Servel, Inc., manufacturers of the Servel gas refrigerator, will produce a new line of gas water heaters.



Servel 30 Gal. Water Heater

In addition to the 30-gallon model illustrated, 20-gallon and 45-gallon sizes will be manufactured. All heaters will be of the automatic storage type with 100 per cent safety controls on main burner and pilot. A spherical tank is used in the 20-gallon model and elongated spheres in the 30-gallon and 45-gallon sizes.

The overall dimensions of the 30-gallon model are: 24 inches in width, 44⅜ inches in height, and 26¾ inches in depth, including draft diverter. These dimensions are shorter and greater in diameter than the conventional 30-gallon automatic gas water heater. Preference for heaters of shorter height and larger diameter was shown by gas utilities representing over half of the gas meters in the United States, in a recent appliance survey conducted by the American Gas Association.

One of the features of Servel's new line is the amount of insulation the company's engineers have been able to use in this heater. Insulation will average more than 50 per cent thicker than that used in conventional type automatic storage gas water heaters, it is said.

Portable Shop Desk

A sturdy portable desk for many industrial uses, especially adaptable for shop foremen, shipping clerks, inspectors, dispatchers and others, is made by Lyon Metal Products, Inc.

The model shown stands on 3" swivel casters and has a positive brake attachment. The overall size of the unit is 34½" wide, 30" deep and 53" high (43" high in front).

Metal Shop Desk

The desk hood provides adequate space for the storage of working papers and has a smooth 30" desk top with a 3" overall slope. The spacious drawer, 24" x 28" x 3½", is equipped with a lock for the safekeeping of important papers.

For further details write Lyon Metal Products, Inc., general offices, 9 Clark St., Aurora, Ill.

Inner-Tite Bell Clamp

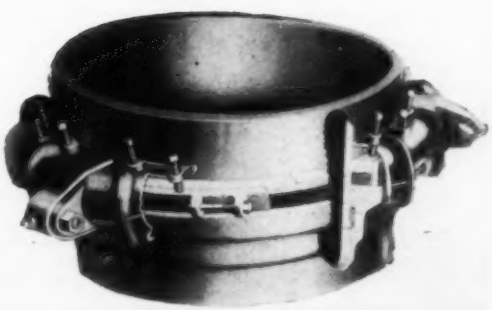
This Inner-Tite clamp for intermediate and high pressure lines features the complete enclosure of the gasket and the uniform distribution of pressure throughout the joint.

It consists of four component parts,—a rectangular section gasket, a pressure ring which encircles the pipe, the hoop which encircles both gasket and pressure ring and a rigid housing completely surrounding the entire joint which carries the tightening screws.

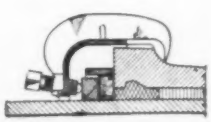
Made for pipe sizes from 4 inches to 36 inches, adaptable for new construction or to prevent leakage and to meet the requirements for increased pressures on distribution lines now in service.

Complete description available with report of physical tests in bulletin issued by Inner-Tite Division of Yara Engineering Corporation, 16 W. Jersey Street, Elizabeth, N. J.

Inner-Tite Clamp, complete and cut-away.



Below:—Section through Bell Clamp.



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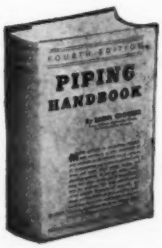
424 Madison Ave., New York, N. Y.

Complete, comprehensive guide to piping design and application

—The data and methods you need for solving every piping problem



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Canadian Activities

Appliance Sales Program at Vancouver, B. C.

Reintroduction of a co-operative sales plan embracing all gas and electric appliance dealers in Vancouver, Victoria, New Westminster and other points served by the B. C. Electric Railway Company has now been announced by W. C. Mainwaring, vice-president in charge of general sales for the company. The program is outlined in a pocket sized booklet of thirty pages issued by the company and which is now being distributed.

In announcing the new plan Mr. Mainwaring points out that the B. C. Electric Railway Company is spending $50,000,000 in the erection of new generating capacity, transmission lines, substations, gas plant additions, and gas main extensions. In connection with this program he states a market survey is being made of all residential gas and electric users of the Company. Information secured from this survey in connection with the market requirements in the appliance field will be made available to the trade.

Some interesting figures are presented in the booklet. It is shown that the saturation point has been far from reached in the appliance field in either the lower mainland or Vancouver Island territory of the Company. In the lower mainland area there are 58,000 residential users of electric light that do not have a gas or electric range while there are 18,000 users of either gas or electric ranges in the Vancouver Island territory. Eighty-five thousand users of current on the lower mainland and 18,000 on Vancouver Island have no gas or electric refrigerator, while 98,000 on the lower mainland and 21,000 on the Island are not now using gas or electric water heaters. There are 50,000 potential markets amongst the company's customers on the lower mainland and 10,000 on the Island for electric washing machines. The survey shows that 110,000 customers on the lower mainland and 23,500 on Vancouver Island do not have an electric ironer at the present time while 40,000 on the mainland and 9,000 on the Island are not yet in possession of an electric cleaner.

The B. C. Electric discontinued in 1938 the direct sale of electrical appliances which had a reasonably high saturation point and confined its activities mainly to major loadbuilding appliances. The Company now announces it will discontinue in future to sell floor lamps, table lamps, and small appliances such as irons, toasters and percolators. The company will continue to sell gas and electric ranges, ovens and rangettes, electric and gas water heaters; electric and gas refrigerators; and electric and gas heaters other than portable models. The company will also handle lamp globes, electric water systems in the rural areas; commercial and industrial gas equipment and new appliances where consumer acceptance must be built up. The company will operate a repair service on all appliances sold by the company and for a reasonable length of time will maintain service on appliances on which it has discontinued sale.

The co-operative plan announced by the company includes advertising allowances of $3.00 on each electric or gas range sold by a co-operating dealer. There is a similar allowance on electric and gas storage water heaters. Half of one percent will be granted as advertising allowance on the sale of electric brooders, milk coolers, dairy water heaters and insert pail heaters, electric farm motors, feed grinders with self-contained electric motors, milking machines, electric water pumps and electric steam sterilizers. The company will offer to customers through dealers trade-in allowances on old gas and electric ranges where the ranges have been in service for a minimum of twelve months. The ranges will be destroyed by the company and not resold.

Concurrently with the announcement of these details the B. C. Electric presents a resume of the advisory services which it has offered to customers, the various departments which it has set up to assist electric and gas dealers and the contacts which it has maintained with all organizations in the electrical sales and contracting field as well as those engaged in the plumbing and heating business.

The plan is being worked out under the direction of Mr. Mainwaring with John H. Taylor as director of dealer development taking much of the responsibility in the interpretation of the various points of the plan and for the direction of their detailed operation. Harold R. Stewart, formerly manager of the New Westminster store of the Company and J. F. Skelton, will assist Mr. Taylor at the Vancouver office as dealer development representatives and will have their headquarters at the Vancouver office of the Company. Home Service, light and power, lighting and residential services, home lighting, industrial development, and gas sales officials of the company are all co-operating in the working out of this program of closer relationship of the B. C. Electric and the trade.

L P Plant Proposed for Nelson, B. C.

New type commercial gas plants using butane or propane as their base material were recently reported to the Nelson City Council as being simple in construction, inexpensive to install and economical to operate. The City delegate, who had visited several centers in the State of Washington for the purpose of inspecting these plants, reported that they were giving satisfactory service.

Alderman T. H. Waters, who had conducted the investigation for the City of Nelson, said he had spent some time with Standard Oil officials at Vancouver. He had then visited the gas plant at Anacortes, Washington. This plant had one new type machine and one old type machine and served from 109 to 200 customers who had 645 outlets. In Anacortes there was no gas storage tank and he reported that the gas generated went directly into the mains.

In Everett, Washington, it was found there were 95 miles of gas tanks with 2500 customers scattered over the city. The plant was operated by a staff of four and its summer production was 160,000 cubic feet, rising to 250,000 cubic feet in the winter. This plant had propane tanks and after five years experience with the new type, was now tearing down its former coal gas plant.

Medicine Hat Greenhouses Heated with Natural Gas

Natural gas is used to help nature in the production of cut flowers for Dominion-wide distribution out of season at Medicine Hat, Alberta. Here six large greenhouses covering more than sixteen acres, with an annual production valued at $500,000 are operated. In addition to the six large units there are a number of smaller greenhouses.

(Continued on page 60)

Gas Appliance Sales Program Augmented With New Dealer Sales Kit

Of the 21,305,000 gas ranges in use in the U. S. and Canada, 60%, or nearly 12,730,000 are more than ten years old. To help dealers sell this highly profitable market, gas utilities and manufacturers have launched the largest national advertising and promotional program in their history.

A new sales kit designed to help dealers tie-in to the gas industry's enlarged promotional activity and sell better grade gas ranges in volume post-war, will be available early in September, according to James I. Gorton, Association of Gas Appliance & Equipment Manufacturers, "CP" Promotional Director.

This new "CP" sales kit, entitled "A New Kind of Post-War Plan —Selling 2 Out of 3 Women For You!" is a joint project of 20 gas range manufacturers who build gas ranges to "CP" standards.

Chief purpose of the "CP" kit is to bring dealers up-to-date on the gas industries' new $1,400,000 national advertising and promotional campaigns, sales training programs, New Freedom Gas Kitchen activity, architect and builder reference manual, new home builder's programs, and other A.G.A. and A.G.A. E.M. promotions. In addition to these industry-wide campaigns, each of the 20 "CP" manufacturers is planning enlarged campaigns to sell individual brand names and features.

Material for use by dealers and described in this new "CP" kit, includes window and floor displays, bill stuffers, wall murals, kitchen photographs, sound slide films, billboard and car-card posters, miniature kitchen displays, salesmen's selection and salesmen's training guides, newspaper ads and store planning guides. All industry-wide material will be supplemented by individual programs produced by each of the 20 "CP" manufacturers.

Copies of the kit are available from the Association of Gas Appliance & Equipment Manufacturers, "CP" manufacturers, and from gas utilities.

U. S. and Canadian gas range manufacturers who build ranges to "CP" standards are:

A-B Stoves, Inc.
American Stove Co.
Caloric Gas Stove Works
Cribben & Sexton Co.
Detroit-Michigan Stove Co.
The Estate Stove Co.
Glenwood Range Co.
James Graham Mfg. Co.
Grand Home Appliance Co.
Hardwick Stove Co.
A. J. Lindermann & Hoverson Co.
O'Keefe & Merritt Co.
Roberts & Mander Stove Co.
Geo. D. Roper Corp.
Standard Gas Equipment Corp.
The Tappan Stove Co.
Western Stove Co., Inc.
In Canada:
Clare Bros. & Co., Ltd.
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INVESTIGATE
LIQUEFIED
PETROLEUM GAS
AS A "STAND-BY"
OR AS A REPLACEMENT
FOR YOUR PRESENT SUPPLY
We can show you facts and figures about the superiority of liquefied petroleum gas that will surprise you. We can show you examples of gas companies who have changed over completely to liquefied petroleum gas, with more satisfactory service to their customers, and of others who have found it more advantageous to use liquefied gas as a "stand-by."
Let us make a study of your requirements, and we can give you the facts and figures.
THE OXFORD COMPANY
Oxford, Pennsylvania

News of the Gas Industry

Gas Research Committee Meeting in Los Angeles

Sponsored jointly by the committee on domestic gas research of the American Gas Association and the manufacturers-sales-advertising sections of the Pacific Coast Gas Association, a two-day West Coast conference on domestic gas research was held at Hotel Ambassador, Los Angeles, July 26-27.

Approximately 125 gas utility technicians, engineers and executives, representatives of gas appliance and equipment manufacturers and distributors, and local and national association officials attended the conference, which was restricted to discussions of technical phases of domestic gas research and presentation of reports on current and completed research projects of the A. G. A. Laboratories.

National association officials and technicians present included Eugene D. Milener, New York, secretary, A. G. A. committee on domestic gas research; F. M. Banks, Los Angeles, chairman of that committee; R. M. Conner, director, K. H. Flint, chief engineer of industrial gas research, and Herbert Luoma, chief engineer of domestic gas research, of the A. G. A. Laboratories, Cleveland, O.

The program for each day was divided into a general session from 9:30 a.m. to noon, a luncheon meeting at 12:30, and group panel sessions on gas cooking, gas water heating and gas house heating research, with briefings of latest research, and general discussion, in the afternoon.

Messrs. O'Connor, Flint, Luoma, Gregg and Ourusoff read abstracts from papers presented at past group meetings. Paper, "Review of Research in Kitchen Ventilation," by Ourusoff and Gregg was printed in full in June issue of the *Journal* "Water Heaters for Maximum Service Efficiency," by H. Luoma, was printed in full in the April issue of the *Journal;* also, "Methods of Reducing Gas Range Surface Temperatures," by R. M. Connor, was printed in April issue.

The Gas Water Heating Research Panel, which convened in an adjoining conference room at the same time, was presided over by Mr. Geyer of Los Angeles, a member of the technical advisory group for gas water heater research.

The Gas House Heating Research Panel was presided over by A. B. Benowsky, past-chairman of the AGA subcommittee on approval requirements for central heating appliances.

Principal subject of discussion at this session was the design of large atmospheric gas burners for house heating and the extinction of minimum noises in such installations.

The July 27 general session opened at 9:30 a.m., with Eugene D. Milener, New York, secretary, AGA committee on domestic gas research, presiding.

The first paper was entitled "Ability of Primary Air Control Devices to Regulate Injection and Resist Closure Due to Dust, Lint and Grease," prepared by F. E. Vandaveer, formerly of the Cleveland laboratory.

Mr. Vandaveer's paper was published in full in April issue of the *Journal.*

Research on Manufactured Gas at Battelle Institute

Under the sponsorship of the American Gas Association, research engineers at Battelle Memorial Institute, Columbus, Ohio, have set out to determine what goes on in a water-gas generator. For more than sixty years, gas has been made from steam and coal or coke by the water-gas process, and, for just as long, the exact method by which the gas is formed has been a matter for discussion and speculation.

As explained by Ralph Sherman, supervisor of fuels research at Battelle, a greatly increased demand for manufactured gas for residential heating is expected after the war. To meet this demand, the gas industry faces a great expansion in production. Processes and plants of large output and low-capital cost are required, because the full capacity is needed but a few days per year. A more complete knowledge of the mechanism of the water-gas reaction may permit changes in design or operation that will obtain from the highly reliable water-gas set more gas at lower cost.

Availability of cheap oxygen in the post-war period may make it economical to mix oxygen with the steam to produce more gas without increase in the size of the generator. Gasification under high pressures should make it possible to reduce the size and cost of the gas-making equipment. The effect of such modifications on the mechanism of the combination of carbon and steam will be investigated as part of the research at Battelle.

This investigation is part of the million-dollar research program being conducted by the Manufactured Gas Production Research Committee of the American Gas Association to assure the availability of manufactured gas at low cost for all requirements after the war. P. T. Dashiell, vice-president of the Philadelphia Gas Works Company, is chairman of the Committee, and Edwin L. Hall, of the American Gas Association, is coordinating secretary, with responsibility for direct supervision of the program.

Battelle Memorial Institute, in whose fuels laboratories the experimental study is already in progress, is an endowed foundation for education and industrial research. It conducts research in fuels, metallurgy, chemistry, physics, ceramics, and other physical and engineering sciences.

Research Program of Standard Oil Co. (N. J.)

Plans for two major petroleum research centers, to be completed late in 1946 or early 1947, were announced Aug. 22, by Eugene Holman, president Standard Oil Company (N. J.)

The program will provide scientists of Standard Oil Development Company, central technical organization of the Jersey Standard group, with the most modern and extensive research facilities in the oil industry anywhere in the world.

"The effectiveness of scientific research in protecting and raising the people's living standards and in opening new realms for human endeavor is one of the outstanding facts of our day," Mr. Holman said. "Free people everywhere have particular cause at this time to be grateful for the research carried out in the laboratories of our country during the past decades. From that research came the weapons that saved us from disaster and made possible the victory we are now thankfully celebrating.

The new centers will be at Linden, N. J., and at Baton Rouge, La., at both of which places Standard Oil Development Company already has large laboratories. The expansion program ultimately may involve the expenditure of $8,000,000. At the outset eight buildings containing a total of 350,000 square feet of space will be erected in a landscaped area of 60 acres at Linden, N. J., and one building containing 35,000 square feet will be put up at Baton Rouge.

Adding to Mr. Holman's announcement, R. P. Russell, president of Standard Oil Development Company, said the new laboratories would be used not only for developing improved products from oil and processes for producing them but in addition extensive work on extending sources of supply of oil products would be carried out. This latter work will include production of liquid hydrocarbons from natural gas, gasification of coal, oil from coal and production of oil from other carbonaceous deposits such as oil shale.

C. L. Williams Is Added to Foxboro's New York Staff

The Foxboro Company, Foxboro, Mass., announces that Clarence Leslie Williams has joined its staff of sales engineers whose headquarters are in the company's New York office, 420 Lexington Ave. He has been assigned to the northern New Jersey territory and has already entered upon his new duties.

H. Carl Wolf to Direct American Gas Assn.

H. Carl Wolf, president of the Atlanta Gas Light Company, Atlanta, Ga., has been elected managing director of the American Gas Association, effective October 1, 1945, it was announced early in August by J. French Robinson, president of the Association. Mr. Wolf will succeed Alexander Forward, managing director since 1923, who is retiring from active business.

Mr. Wolf was born in Edwardsville, Illinois, and graduated from the University of Illinois, having earned both his bachelor's and master's degrees in electrical engineering. He entered the utilities field as assistant engineer for the Illinois Commerce Commission and later became manager of the Edwardsville (Illinois) Water Company. In World War I, he was a captain in the United States Engineer Corps, serving 18 months in France as a combat engineer and with the American Peace Commission.

H. Carl Wolf

Alexander Forward

From 1922 to 1929, Mr. Wolf was chief engineer of the Public Service Commission of Maryland. He became assistant to the president of the Central Public Service Corporation and later was elected vice-president of Consolidated Electric and Gas Company and then president of the Central Indiana Gas Company and its associated companies.

Mr. Wolf was elected president of the Atlanta Gas Light Company in 1938, and until recently he also served as president of the Mobile Gas Service Corporation and Florida Public Utilities Company. He has been a director of the American Gas Association since 1941 and in 1942 was appointed chairman of the Association's National Advertising Committee. He is a director of the First National Bank of Atlanta, past president of the Indiana Gas Association and the Southern Gas Association and past chairman of the Industrial and Commercial Gas Section of the American Gas Association. Mr. Wolf also is serving as Regional Chairman of the Committee for Economic Development for the Sixth Federal Reserve District. As managing director of the Association, Mr. Wolf will play an important part in directing the vastly expanded program of research, sales promotion and advertising for which the gas industry and allied companies throughout the country have pledged more than $1,500,000 a year for the next three years.

Mr. Forward, who is retiring after twenty-two years as executive head of the Association, began his business career as a newspaper man. He was on the staff of leading newspapers and served as managing editor for dailies in Virginia. He was secretary to the Governor of Virginia from 1914 to 1918; attended military training camp at Plattsburgh in 1916 and was appointed president of the Virginia Division, Military Training Camps Association, charged with examination and recommendation to the War Department of candidates for officers in World War I.

He was appointed a member of the Virginia State Corporation Commission in February, 1918, but took leave of absence to become director of relief supplies to the Balkan States, with headquarters successively in Rome, Athens, Salonika and Bucharest. In appreciation for his meritorious work, Major Forward was decorated an officer of the Order of the Crown of Rumania.

Mr. Forward returned to his duties with the Virginia Commission in 1919 and served as State Fuel Administrator in 1922. He was re-elected to the Virginia Commission but resigned in 1923 to become managing director of the American Gas Association. During his 22 years of service, the annual budget of the Association has increased from $255,000 to $2,000,000 and it has become the national organization for the development and coordination of the five billion dollar gas industry.

Education and Scholarship Fund Established by Peoples Natural Gas Co.

Establishment of a fund to provide scholarships and other financial assistance for higher education to the children of employes who lose their lives in line of duty with the company is announced by E. M. Borger, president of The Peoples Natural Gas Company.

The fund has been established by The Consolidated Natural Gas Company, of which Peoples is a subsidiary, and is known as The Consolidated Natural Gas System Educational Foundation. Bankers Trust Company, New York, is trustee with a committee of five employes from the subsidiary companies as administrators. Funds are provided by Peoples and four other subsidiary companies.

The foundation will provide for instruction in colleges or universities, business schools, vocational or trade schools, professional schools, and other private or public institutions of learning other than public or private grade or high schools or college preparatory schools. Financial assistance includes tuition, books, fees, other like expenses and normal living expenses.

John P. Curry Retired September 1st

John P. Curry, Shenango Valley manager for United Natural Gas Co., retired from active service Sept. 1, company officials in Oil City, Pa., have announced.

Mr. Curry has completed more than 47 years of continuous service with the gas company and its predecessors. For almost 35 years he has held the position of local manager in the Shenango Valley and adjacent Ohio district, which comprises the largest distribution area in the United Natural's system.

Mr. Curry's career in the natural gas industry actually began prior to his association with the predecessors of United Natural when as a youth in 1895 he was employed as a construction worker on gas distribution mains being installed in Emlenton, the community in which he was born.

Plant Location Service

With increasing emphasis being placed on decentralization, or relocation, national manufacturers will find useful the new and free confidential service of New England Industrial Development Corporation, 80 Federal Street, Boston 10, Massachusetts, non-profit industrial service organization of leading New England business executives.

Factual reports are supplied to answer specific questions concerning possible plant locations in New England. Pertinent data from public and private sources is submitted with comments by expert consultant.

Identity of inquiring companies is held confidential and direct contacts are established only upon specific request. Service covers entire New England area.

For additional information write New England Industrial Development Corporation, above address.

J. E. Kern Guest of Honor at Farewell Dinner in L.A.

A group of 300 persons, including the guest of honor's associates in the Southern California Gas Co. and Southern Counties Gas Co., appliance dealers, distributors and manufacturers, gathered at the Los Angeles Elks Temple on the night of July 24 at a farewell dinner tendered J. E. Kern, who resigned August 1 as general supervisor of appliance and dealer sales of the Southern California Gas Co., to enter the appliance distribution and retailing business in Pasadena, Calif.

J. E. Kern

Also present were a number of out-of-town gas company and appliance firm representatives who were in Los Angeles to attend meetings of the A.G.A. and P.C.G.A. on July 25-26-27.

J. G. Merkle, general supervisor of market analysis and promotion of the Southern California Gas Co., who has taken over Mr. Kern's former duties along with his own under the new title of general supervisor of appliance and sales promotion, served as master-of-ceremonies. Tributes were paid to Mr. Kern by W. M. Jacobs, the company's general sales manager, and other company executives.

Mr. Kern has associated himself with the Ralph L. Stowers appliance firm, Pasadena. The company is a retailer of gas refrigerators and other appliances and co-distributor for Servel in the Pasadena area.

He was on the staff of Southern California Gas Co. for 21 years. He entered the company's service as a rate and appraisal engineer, rose to industrial sales engineer in 1926, and, with the introduction of the Servel gas refrigerator in the 1930's, became a refrigerator salesman. During 1932 and 1933 he acted as supervisor of the Los Angeles division, handling sales of all gas appliances. In 1934 he was appointed general supervisor of domestic sales and recently received the title of general supervisor of appliance and dealer sales.

He has played an active part in the affairs of the Pacific Coast Gas Association, being the 1945 chairman of the association's Gas and Refrigerator Council, a utility-manufacturer group which has held several conferences this year.

Sale of Nashville Gas and Heating Company

Control of Nashville Gas and Heating Company was transferred on July 18, 1945, from The United Gas Improvement Company of Philadelphia, to Tennessee Natural Gas Lines, Inc., Nashville, Tennessee. The sale of all the common stock of the Company was made with the approval of The Securities and Exchange Commission.

Wade Thompson is President of Tennessee Natural Gas Lines, Inc. L. B. Richards will remain as President of Nashville Gas and Heating Company, which position he has held since the beginning of the year, when he replaced Samuel E. Linton, who retired after 29 years with Nashville Gas and Heating Company, and 46 years with Subsidiary Companies of The United Gas Improvement Company.

New officers elected at the time of transfer were Thomas W. Goodloe, Financial Vice President; Wm. C. Terry, Secretary-Treasurer; and A. E. Hanson, Assistant Secretary. Terry was previously Assistant Secretary and Office Manager and Hanson was in charge of General Accounting for the Company.

As soon as war conditions permit, it is planned to convert Nashville from manufactured gas to natural gas, obtaining a supply from the 24" pipe line of The Tennessee Gas and Transmission Company, which passes within 17 miles of the city.

Kenneth Magers Joins Foster & Davies Inc.

Kenneth Magers, for twenty years Advertising and Publicity Manager of The Cincinnati Gas & Electric Company and associated organizations, has joined the staff of Foster & Davies, Inc., advertising agency, Cleveland, Ohio. Previously, he had been Advertising Manager of a number of concerns.

Kenneth Magers

Past-President of the Public Utilities Advertising Association, Ken Magers has served as Chairman of the Better Copy Committee and was a frequent winner in the Annual Better Copy Contest.

Many times a member of the Advertising Committee of the American Gas Association, in addition to public relations advertising, he is probably best known in the gas industry for pioneer work in home heating and industrial gas publicity.

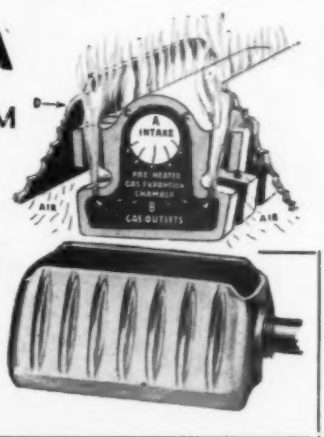
Welcome to Veterans

Facing the Hudson River where it can be seen by returning veterans debarking at nearby piers, a huge red-white-and-blue "Welcome Home" sign has just been painted on its West 44th Street gasholder by Consolidated Edison Company of New York, Inc. The sign, two hundred feet above ground level, is forty-eight feet high.

COLUMBIA
LITTLE GEM
GAS BURNER

A small unit which may be used singly or in series. Each unit 6½ in. long x 4 in. wide. Wide application of domestic and commercial uses. May be used in round or square steam or hot water boilers, warm air furnaces, Arcola type heaters and circulating heaters. Used commercially for heating tanks, boilers, ranges, ovens, etc. Natural, manufactured, or mixed gas. Complete combustion without pre-mixing. Write for circular.

COLUMBIA BURNER CO.
729 Ewing Street
Toledo 7, Ohio



CONNELLY IRON SPONGE

High in efficiency . . . low in cost. In hundreds of plants throughout the country, Connelly Iron Sponge has proven itself . . . the finest purification material on the market. Not only does it lower your purifying cost but its high activity and capacity tends to reduce distribution and service complaints because of the cleaner gas which ultimately lowers operating and maintenance costs.

If you have a problem in gas purification, Connelly's 68 years of experience is at your service. Our engineers can help you . . . there is no obligation on your part.

CONNELLY IRON SPONGE & GOVERNOR CO.
ELIZABETH, N. J. LOS ANGELES, CALIF.
3154 SOUTH CALIFORNIA AVE., CHICAGO 8, ILL.

Office of War Utilities to be Dissolved

Edward Falck, director of the War Production Board's Office of War Utilities, states that his organization will wind up its operations and be dissolved by September 30, 1945. The Office of War Utilities was created February 23, 1943, as a semi-autonomous unit wtihin the War Production Board, to have jurisdiction over wartime regulation of power, water, gas and wire communications utilities.

Executive and Sales Offices Moved to New York

Remington Rand Inc. announces the removal of the Executive, Sales, Merchandise, and Pricing Departments of the Systems Division from Buffalo to New York City. The new offices are located in the Remington Rand Building, 315 Fourth Avenue, New York 10, N. Y.

The company also announces a basically new development inventory record control by the Systems Division. It utilizes a revolutionary Graph-A-Matic Computing Chart, called by its pioneer users, "The Chart That Thinks." This remarkable device directly converts actual and available inventory quantities into the time it will take to consume them. It is applied to the control of inventories, of raw material, finished parts, purchased parts, perishable tools and supplies, and other inventory items. It unmistakably signals order point, expediting point, normal, under-stock, out-of-stock, and excess stock positions. It makes management-by-exception automatic in inventory control.

A Graph-A-Matic Control System eliminates both computing time and arithmetical errors because a direct setting of the Graph-A-Matic Control Signal over the actual and available balance scale provides the automatic conversion to weeks supply and condition of stock.

Williams Oil-O-Matic Holds Managers' Meeting

Newly appointed Oil-O-Matic divisional managers, each a former district representative of many years standing, met at the home office, August 6, for a week of intensive sales discussion and planning. A pre-meeting swing around their territories by the divisional managers, marked their official return to full-time sales duties after an interim on special wartime assignments. C. W. Cornelssen, manager of Heating Sales, presided at the week's sessions.

While members of the factory sales and advertising departments presented complete details of Oil-O-Matic's action program, the highlight of the meeting was the personal report submitted by the divisional managers. These reports—based on personal contact and analysis—cover: The competitive situation in the divisional manager's territory; The condition of present dealers; The immediate needs of his dealers and territory; A five year estimate of sales in the territory.

Two immediate objectives were set forth: 1. Man district representative's territories; 2. Secure dealers for present "open" towns.

Henry W. Burritt, president of the merged Eureka and Oil-O-Matic companies, came from Detroit to attend the meeting and took an active part in the discussions. Mr. Burritt relished his first opportunity to get acquainted with Oil-O-Matic men at work.

Airtemp Division Appoints C. R. Mougey Adv. Mgr.

Promotion of Charles R. Mougey to the post of advertising manager of Airtemp Division, Chrysler Corporation, was announced by the company here recently.

A former director of the Columbus Advertising Club and member of its war advertising council, Mougey has been at Airtemp as assistant advertising manager since Oct., 1944. Before that time, he served 10 years with the Ohio Fuel Gas Company, leading Midwest producer of natural gas and merchandiser of gas appliances, as assistant advertising director.

Prior experience includes work as publisher and editor of house organs, staff work at advertising agencies, and as a manufacturer's representative. He is a native of Portsmouth, O., and was graduated from Ohio State University.

Estate Announces Illinois Distribution Plans

Appointment of the Crum Distributing Company, Decatur, Illinois, as Estate Heatrola Range and Heater distributor for 20 Central Illinois counties, was announced today by S. C. Bernhardt, Vice-President in Charge of Sales of The Estate Stove Company.

In making the announcement, Mr. Bernhardt stated that a change in the Estate distribution set-up was necessitated by the decision of Linn & Scruggs Company, former Estate Heatrola distributors, to liquidate the wholesale division of their company. The Crum Distributing Compan, a new distributing concern, is headed by Mr. R. R. Crum, who was formerly general manager of the wholesale division of Linn & Scruggs Company.

Oil-O-Matic divisional managers at their August 6 meeting with factory sales and advertising officials

Left to right: Charles C. Branch, Divisional Manager; J. H. Skaggs, Divisional Manager; H. L. McMurry, Sales Representative; L. G. Brown, Divisional Manager; L. A. Casler, advertising agency; C. W. Cornelssen, manager of heating sales; W. A. Matheson, vice president in charge of the Oil-O-Matic Division; O. E. Nesmith, chief engineer; E. H. Davison, assistant manager of heating sales; Ray Pinkerton, furnace sales; G. D. Greenfield, advertising agency; C. Allen Fish, divisional manager; T. H. Green, divisional manager; J. H. Read, advertising and sales promotion manager.

To Start Gas Pipe Line

C. M. Coleman, president of the Tennessee-Kentucky Natural Gas Corp., stated July 24th, that the company probably will be ready to start construction of its natural gas pipe line from Knox County, Ky. to Knox County, Tenn., within 30 days.

Mr. Coleman expressed the opinion that the Federal Power Commission will consider his company's application for a permit to cross the Kentucky-Tennessee state line "only a formality."

The corporation already has obtained some 80 miles of 16-inch pipe for the project, and is now busy on the job of drilling 100 wells in Knox County, Ky.

Army-Navy Additional Awards for American Radiator & Standard Sanitary Corp.

On July 30, the Army and Navy "E" Award for high achievement in the production of war materials was formally presented to the men and women workers of the Pittsburgh Works of the American Radiator and Standard Sanitary Corporation.

The impressive ceremony, held at the Works, was largely attended by the employees and their families and many of the officials of the Corporation.

Colonel Robert C. Downie, Chief of the Pittsburgh Ordnance District, presented the "E" Pennant, which was accepted by Arthur P. Woolfolk, Works Manager and John Hiebner, the oldest employee.

Lieutenant Commander T. H. Cable, Office Inspector Naval Material, Pittsburgh, assisted by Private James B. Cleaver of Deshon General Hospital, presented the Army and Navy "E" pins to the employees. Joseph E. Webb accepted the Award on behalf of the employees.

In addition to the Pittsburgh Works, three other Units of the Corporation have recently received the Army and Navy "E" Award, including the Stamping Plant, Buffalo, New York, on July 24, the Baltimore Works on July 25, and the Branch House, Chicago, on August 1st.

Previously, the Louisville Works, Louisville, Kentucky, on October 30, 1943, the Richmond Works, Richmond, California, on March 22, 1944, and the Elyria Works, Elyria, Ohio, on November 20, 1944, received the Army and Navy "E", making in all seven units of the Corporation thus honored.

Gild Holds Council Meeting

An informal round-up of the Gild of Ancient Supplers August 17th heard Bernard V. Pfeiffer, manager of gas operations of the United Gas Improvement Co., Philadelphia, Pa., report "off-the-record" on what he learned of German gas plant operations during a three-month tour of that country.

The dinner gathering followed a meeting of the Gild's Great Council at the Meridian Club, Philadelphia, with 21 Supplers and Burghers attending. Mr. Pfeiffer, commissioned a provisional colonel in the Army for the trip, spoke for two hours. With several other industrial investigators, he toured Germany and reported to the technical industrial intelligence committee on what the Nazis accomplished in the gas industry that might prove helpful in this country.

The Great Council voted to hold a meeting in New York at the time of the American Gas Association convention October 24th. A nominating committee, to present a slate of officers for the coming year, includes; K. C. Tomlinson, American Meter Co., San Francisco, California, chairman; David S. Sharpe, Geo. D. Roper Corp., Atlanta, Georgia; Stephen D. Day, Barrett Co., Houston, Texas; G. D. Yeatton, Hardwick Stove Co., Boston, Mass.; and J. H. Moore, Gas Age, New York, N. Y.

New Silicone Valve Lubricant

Merco Nordstrom Valve Company is now the exclusive distributor of a new valve lubricant which possesses unusual properties advantageous for a number of severe services.

This lubricant is a Dow Corning silicone product and is identified as Nordcoseal Lubricant No. DC234-S. It is colorless and one of its outstanding properties is that its viscosity changes only slightly over a very wide temperature range. It is recommended for working temperatures ranging from —40°F to +400°F. Due to its extremely low vapor pressure, it does not evaporate appreciably even at elevated temperatures.

Its principal services are steam, hot water, hot air, oxygen, high vacuum, also for dilute solutions of mineral acids (except nitric and hydrofluoric acid below 250°F); Hydrochloric acid, natural and synthetic rubbers, acetic acid, acetic anhydride and ethyl alcohol below 250°F.

It is available only in soft bulk form for application by grease guns. Further details may be obtained from Merco Nordstrom Valve Company, 400 Lexington Avenue, Pittsburgh 8, Pa.

Edward Van der Pyl Receives Norton Company Appointment

Edward Van der Pyl has been appointed superintendent of the Norbide Plant by Norton Company, Worcester, Mass. He has been with Norton Company for 30 years and for the last few has been specializing in development work on Norbide and diamond products.

Increased demand for Norbide products (Norton Boron Carbide) such as lapping abrasive, pressure blast nozzles, gage blanks and metallurgical compound has resulted in the establishment of a separate plant for their production at Worcester. The molding and finishing of Norbide products has now been centralized in the buildings formerly occupied by the Whitney Envelope Company and located almost adjacent to the main Norton plant. Actual production of the boron carbide itself will continue at the Norton Chippawa plant where electric furnace facilities are available.

"JOURNAL" GAS FLOW COMPUTERS

High Pressure
RANGE:
Cu. Ft. of Gas Per Hour—100-10,000 M
Diameter of Pipe—Inches ¾-30
Difference in Absolute Pressure—Lbs. per sq. in., 1-500
Sum of Absolute Pressures—Lbs. per sq. in., 2000-20
Specific Gravity—1.5-.35
Length of Pipe—Feet 100-5000
Length of Pipe—Miles 1-250

Low Pressure
RANGE:
Cu. Ft. of Gas Per Hour—10 to 500 M
Pipe Diameter—¾" to 48" (including standard and actual weight up to 4")
Pressure Loss—Inches .01-10
Length of Pipe—Feet 30-30,000
Specific Gravity—1.5-.35
Constants—1400-1000

Made of durable celluloid, encased in a convenient leatherette cover with complete instructions. Actual size 6¼ x 7½

3.50 Each Postpaid

American Gas Journal
53 Park Place, New York 17

GPM
IRON HYDROXIDE

The mark of
unerring dependability
in purification

GAS PURIFYING MATERIALS CO., INC.
3-15 26th Ave.
Long Island City 2, New York

Now Ready

The American Gas Handbook, 1945 Edition, was mailed to paid subscribers to the American Gas Journal, early this month.

It is issued bi-annually as an auxiliary service to our subscribers. It has no sales price.

The 1945 Edition contains 208 pages of data material, charts and tables covering every phase of gas utility operation.

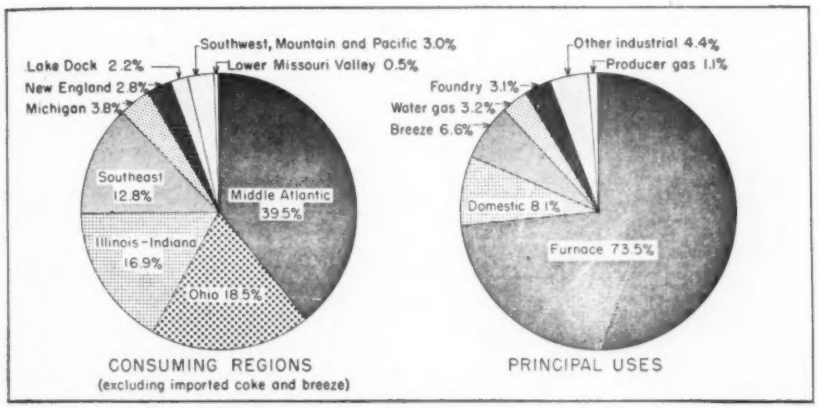
It is handsomely bound;—size 8½" x 11"

Published by

AMERICAN GAS JOURNAL

53 Park Place New York 7, N. Y.

DISTRIBUTION OF BYPRODUCT AND BEEHIVE COKE IN THE UNITED STATES, 1944



A Bureau of Mines report presents statistical data on the distribution of byproduct and beehive coke by principal uses and geographic areas in the United States in 1944 and constitutes the ninth such compilation of figures by the Bureau of Mines, United States Department of the Interior.

Domestic coke shipments increased 34 percent over 1943 and were responsible for the gain in total coke consumption in 1944. The domestic coke trade was the second largest consuming channel and accounted for 8 percent of all coke and breeze consumed compared wtih 6 percent in 1943. Consumption of coke in blast furnaces declined slightly and represented approximately 74 percent of the total coke and breeze consumption compared with 75 percent in 1943. Shipments to certain classes of manufacturers were less, and total deliveries to the manufacturing group as a whole (foundry, producer gas, water gas, and other industrial) declined from 13 percent in 1943 to 12 percent in 1944. The demand for coke breeze in 1944 increased 213,597 tons over 1943 and reached 5,176,191 tons. This tonnage represented approximately 6 percent of the total consumption of coke and breeze, the same ratio as in 1943.

Williams Oil-O-Matic Appoints Division Representatives

Joseph C. Cooper has been appointed a New England district representative for Oil-O-Matic, according to an announcement by W. A Matheson, vice president in charge of the Williams Oil-O-Matic Division, Eureka Vacuum Cleaner Company. Mr. Cooper's extensive oil heating experience in the New England area dates back to 1925 when he joined Petroleum Heat & Power Company, as a salesman. In 1930 he went with Gilbert & Barker Manufacturing Company as a divisional sales manager. Previous to his Oil-O-Matic connection, Mr. Cooper was sales manager for Bemis & Call Company. Mr. Cooper will operate under the direction of C. W. Cornelssen, manager of Heating Sales.

Mr. Matheson also announced the appointment of Howard C. Curren as midwestern district representative. Mr. Curren's background includes 21 years of sales and advertising experience.

Laboratories Engineer Decorated By Two Governments

The third employee of the American Gas Association Testing Laboratories to be honored by the armed forces with the Bronze Star Medal for distinguished service is First Lt. Frank E. Hodgdon now with the Transportation Section, Continental Advance Section in Germany.

Lt. Hodgdon was also honored by the French government, receiving the Croix de Guerre avec Etoile d'Argent or French Cross and Silver Star, presumably for the same service that brought him the American honor.

Lt. Hodgdon served overseas for 31 months in England, North Africa, Italy, France, and now Germany.

The two other Laboratories' employees who have won the Bronze Star Medal are First Lt. Carl F. Geltz and Capt. Robert T. Hlavin. Lt. Geltz is also stationed in Germany and details of his citation are unknown. He is an officer of an engineering unit. Captain Hlavin recently visited the Laboratories after 38 months in the Pacific where he served as Aide de Camp to General Robert S. Beightler of Ohio's famed 37th Division.

Lt. Geltz besides holding the Bronze Star Medal, holds the Presidential Unit Citation as does another Laboratories' Engineer, David G. Willich, now stationed in Giebelstadt, Germany, with an engineering unit.

Also in the German area is first Lt. Morton Z. Fineman who is associated with a mobile petroleum products laboratory of the Quartermaster Corps.

Another recent visitor to the Laboratories was Lt. H. C. Clark who has served in the Navy in both the Atlantic and Pacific. He participated in a number of invasions as well as battles at sea including the sinking of a famous German battleship in Norwegian waters.

Government Urges Production to Avert Winter Gas Shortage

Heavy compressor equipment must be produced on schedule if another natural gas shortage next winter is to be avoided in Ohio and three neighboring states, employees of The Cooper-Bessemer Corporation have been told by government representatives.

Absenteeism must be cut to the absolute minimum, they were warned, and a seven-day work week may be necessary for the remainder of the summer.

The company is rushing to completion 17 compressors, totaling 20,000 horsepower. This equipment will be used by the Panhandle Eastern Pipe Line Company to pump an additional 50,000,000 cubic feet of gas daily from Texas to Ohio, West Virginia, eastern Indiana, and lower Michigan.

For this pipeline project, Cooper-Bessemer is building five Type GMV 10-cylinder compressors each rated at 1,000 horsepower; two Type 22 Twin Horizontal compressors each rated at 1,000 horsepower; and ten Type 24 Twin Horizontal compressors each rated at 1,300 horsepower. When completed these units will be installed in compressor stations in Kansas, Missouri and Illinois.

The new order marks the eighth time in 15 years that Panhandle has purchased compressors from Cooper-Bessemer for use on its gas transmission line. The first units, installed in 1930, are still giving continuous, efficient service.

So far, Cooper-Bessemer has supplied more than 90,000 horsepower on the Panhandle line, more than 50 percent of the compressor horsepower on the entire line. Gas pumped by Panhandle to this area for industrial and home use, originates in the Texas Panhandle. The line now has a daily capacity of 330,000,000 cubic feet of gas and with the new compressors the total daily output will rise to 380,000,000 cubic feet.

GOODMAN
USED SINCE 1897
"Z" HANDLE & LOCKING SLEEVE
GAS MAIN STOPPER

THE GOODMAN STOPPER

Now has the "Z" handle for easy manipulation. When locked in place it holds. Stopper cannot slip. Gas cannot pass. Adjusted in 30 seconds.

Ask for circulars on this and other distribution equipment.

Nearly a half century of service to the Gas Industry.

The Reliable Shut-Off for Street Mains

Safety Gas Main Stopper Co.
523 Atlantic Avenue, Brooklyn, New York

Lambert Meter Co. Awarded Army-Navy "E"

For production of experimental models of radar parts Lambert Meter Company, Plainfield, N. J., was awarded the Army-Navy "E", in a ceremony at the plant on August 17th. Making the presentation was Capt. Howard E. Orem, USN, representing the secretary of the Navy, as most of the plant production was for the Naval forces. Standing from left to right are the captain; Lieut. Col. Graham M. Leslie, who read the citation; Walter Biskay, who accepted the award for the employes; David N. Lambert, president of the company; and a mate of the deck from the Third Naval District Headquarters. The ceremony at the plant was followed by dinner at the Park Hotel for all plant personnel and their guests. —*Photo by Richard C. Gaine*

Lincoln Electric Company Opens New Office

The Lincoln Electric Company announces the opening of a direct factory branch sales office in St. Louis.

The new branch, under the direction of Mr. B. J. Brugge as Welding Engineer and District Manager of Sales and Service, will be located at 4427 Manchester Avenue.

Mr. Brugge has been associated with The Lincoln Electric Company since 1931. He is a graduate of Purdue University and began his career in arc welding with two years in research laboratories of the company. In 1935 he was granted a leave of absence to assist the application of electric welding in the Near East. Serving in the capacity of welding superintendent for the Anglo-Iranian Oil Company, he spent two years at Iran, Persia, supervising welding operations in the construction of refineries and pipe lines. He directed the training of many Persians in the art of welding and increased the Anglo-Iranian Company's welding forces from 30 to 120 arc welders.

Following his work in Persian oil fields, Mr. Brugge spent four months in the British Isles as welding consulting engineer for British and Scottish firms.

During the early years of the war, Mr. Brugge re-designed and constructed the Army's first all welded medium tank at Rock Island Arsenal and helped develop armor plate welding, working with the Army Ordnance at the Aberdeen Proving Grounds. He has also assisted the Navy and Maritime Commission with consulting services on shipwelding.

For the past year Mr. Brugge has served The Lincoln Electric Company in the Detroit area in assisting firms in the design and fabrication of both war and post-war products.

Natural Gas Restrictions Revoked

Three wartime restrictions on natural gas and gas condensate, Petroleum Recommendation 13 and 25 and Directive 79, have been revoked, effective September 1.

Recommendation 13 was issued in October, 1941, to provide for the development of gas condensate fields or pools for maximum production of liquid hydrocarbons, and to insure that such operations did not impair the output of crude oil fields, pools or wells.

Recommendation 25, issued in January, 1942, was designed to assure maximum production of butane, isobutane and isopentane, all essential ingredients of aviation gasoline.

Directive 79 restricted the use of butane as a fuel in well-drilling operations because it was needed for the manufacture of aviation gasoline, as an ingredient in the manufacture of synthetic rubber and for other special processes.

Court Rules East Ohio Gas Co. Must Pay Death Claims

The East Ohio Gas Co. alone is responsible for paying about $500,000 in death claims to families of 73 of its employees killed in the Oct. 20 disaster, the Ohio Supreme Court in Columbus ruled unanimously August 8th.

The company, suing through the widow of Charles F. Turner, who was a research expert, sought to compel the state industrial commission to pay, contending that the company paid into the commission's catastrophe fund for this sort of situation.

The company, suing through the workmen's compensation insurance, the commission and Supreme Court held that, as a self-insurer, it must meet the death claims.

The high court explained there was no law permitting the state to pay in such a case.

L. P. Gas Plant Construction at Everett, Mass. Awarded Stacey Brothers Company

Stacey Brothers Gas Construction Company of Cincinnati, Ohio, one of the Dresser Industries, have been awarded a contract by The Boston Consolidated Gas Company of Boston, Mass., to install at their Everett, Mass. works a complete butane-propane-air-gas mixing plant having a capacity of 10,000,000 cubic feet per day.

The project will involve the installation of seven (7) 25,000 gallon vertical type propane tanks, new mixer building, including other appurtenances, all of which will be installed this fall. The installation will be used as stand-by storage to take care of peak loads in the Boston area.

Stacey Brothers are also furnishing a 1,000,000 cubic foot all-welded holder for the same company which is designed with an internal tank for the storage of 2,329,500 gallons of oil. This installation is already under construction.

Dow Chemical Co. Appoints Arthur Smith, Jr.

In order to facilitate the specialized services connected with the use of magnesium anodes for cathodic protection of pipelines and structures, the Magnesium Division of The Dow Chemical Company has organized a Cathodic Protection Sales Department. Arthur Smith, Jr., has been named manager, with headquarters in Dow's main office at Midland, Michigan. Mr. Smith comes from the St. Louis office, where he was director of magnesium sales for the Southwest territory. A graduate of Michigan State College, he has been with the company since 1937.

E. D. Wacker Gen. Mgr. for Tagliabue Div.

Fernal R. Marlier, President of the Portable Products Corporation, has announced the appointment of E. D. Wacker as General Manager of its C. J. Tagliabue Division, Brooklyn, N. Y. Mr. Wacker for the last eight years has been General Sales Manager, and associated with C. J. Tagliabue for a period of twenty-two years.

Mr. Wacker's broad background of experience in the manufacture of precision instruments particularly well qualifies him for his new position.

Cathodic Protection Sales representatives are at present located in New York, Chicago, Tulsa, Houston and San Francisco.

Postwar Outlook for Continued Growth of Natural Gas Industry

Natural gas companies have been faced with a tremendous responsibility during the war emergency. During a period of increasing shortages of other fuels, this industry has supplied record quantities of natural gas for residential, industrial and commercial uses. Natural gas industry surveys indicate that the industry is in excellent position to expand its service to the public and to other industries, and will continue to produce and deliver increasing quantities of gas in postwar years, according to R. H. Hargrove, chairman, Natural Gas Department, American Gas Association, and vice president and general manager of United Gas Pipe Line Company.

Reserves of natural gas in the United States were recently estimated by E. DeGolyer, an outstanding geologist, at between 140,000,000,000 Mcf and 200,000,000,000 Mcf. American Gas Association reported total sales of natural gas in 1944 at 2,189,392,000 Mcf, approximately 1½% of the nation's proved reserves of natural gas. Thus the industry has a long-term supply of natural gas on which to base its plans for expansion of its service to the public. Exploration, especially new techniques in the search for oil and gas and in drilling to deeper horizons, has in the past resulted in the discovery of increasing gas reserves and the industry is confident that it will be able to continue to find additional supplies of gas.

Total revenue from the sale of natural gas for 1944, according to the American Gas Association's report, were $677,951,900. Sales by the industry for the 12 months ended May 31, 1945, were nearly 8% ahead of comparable period a year earlier, and it is estimated that sales in 1945 will exceed $700,000,000.

There exists a huge potential market for gas ranges, gas water heaters, gas refrigerators, and space heaters for replacement of worn equipment and installation in new homes. There is an additional postwar market for air conditioning, gas house heating equipment, and for summer and winter air conditioning units. Gas summer air conditioning, an industry that was developing about the time Germany invaded Poland, may well become a postwar giant.

Another growing use for natural gas is being developed by the natural gas industry and by the chemical industry, using natural gas as a raw material out of which many of the substances are made which will improve our living conditions in the postwar world. Natural gas companies have been experimenting and financing research projects to discover the products that can be made from natural gas. The whole industry has now combined to support a substantial research project that should open vast new markets for its product.

Looking to the possibility for extended markets, the industry has filed projects or has recently received approval of the Federal Power Commission for the construction of nearly 5,000 miles of additional natural gas pipe line in this country, capable of transmitting more than 400,000,000 additional cubic feet a day at peak movements. Mr. Hargrove called attention to the fact that a recent breakdown of postwar expenditures, made by the Federal Power Commission at the request of the American Gas Association, showed that the natural gas industry expected to spend $160,898,000 for plant expansion, maintenance and inventories and supplies in the 12 months immediately following V-E Day. Of this amount, approximately $120,000,000 would be spent on additional plant and equipment.

Industry leaders foresee an excellent opportunity to help solve the postwar employment problem. Manpower in the gas industry currently is about 10% below 1939, a normal prewar year. The proposed expansion of plants and transmission facilities, development of improved products and methods of preventing waste and new processes of utilization will mean many more jobs in postwar days.

W. D. Turnbull, Sales Mgr.

Kennametal Inc., of Latrobe, Pa., has appointed W. D. Turnbull as General Sales Manager. The Company plans to extend the application of Kennametal to new fields, such as mining, petroleum, and wood-working.

W. D. Turnbull

Mr. Turnbull, a graduate Electrical Engineer from Pennsylvania State College, has had more than 25 years of broad and successful experience in both engineering and sales of products used in diversified industries, and is holder of the Westinghouse Electric Corporation's Award of Merit for outstanding work in these fields.

For four years he was Vice President in Charge of Sales for Pomona Pump Co., of Pomona, California.

He has been closely associated with the mining industry in the design and application of equipment, as well as in the adoption of standardization and safety practices. While with Westinghouse he started the Machine Tool Forum.

American-Standard Announces Personnel Changes

The American Radiator & Standard Sanitary Corporation has announced the appointment of William T. Reed as Manager of their Washington Sales Office, and William H. Baker, Jr., as Assistant Manager of their Pittsburgh Sales Office, effective September 1st, 1945.

Also, the appointment of Frank E. O'Callaghan, Jr., as a Staff Assistant in the General Sales Department, Pittsburgh, as of the same date.

Each of these men have had many years experience in the Company's Sales Organization. However, for the past three years, they have been serving as Special War Work Representatives for different Factories of the Corporation, producing magnesium and steel castings and other materials for war.

These several Plants are now being reconverted to the production of civilian goods, and Messrs. Reed, Baker and O'Callaghan are being returned to the Sales Department.

Irwin Appointed Manager of Philadelphia Electric Co.

K. M. Irwin has been appointed manager of the Engineering Department of the Philadelphia Electric Co., Phila. Pa., and subsidiary companies. He joined The United Gas Improvement Company organization in 1919 as assistant to the electrical engineers of the Operating and Engineering Department. He was subsequently named mechanical engineer of the Engineering Development Department and continued in that work until transferred to the Philadelphia Electric Company in 1931 as assistant to the vice-president in charge of engineering, the position he held at the time of his recent appointment.

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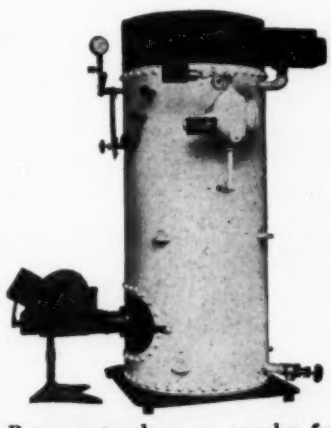
GAS — OIL BOILER
3 HP to 35 HP.



Burns natural gas or regular furnace oils with equal efficiency using same burner.

P. M. Lattner Mfg. Company
Cedar Rapids, Iowa

Obituary

DONALD A. HENRY

Donald A. Henry, rate and valuation engineer for Stone and Webster Service Corp., New York, N. Y., and active in utility rate-making circles for more than 30 years, died suddenly August 3 in the offices of Central Illinois Electric and Gas Co., Rockford, Ill., where he was working on the proposed changeover of that property to natural gas. He was 58 years of age.

Nationally known as a rate expert in the utility field, Mr. Henry had appeared as a witness before many of the Federal and state regulatory agencies and courts as well as city councils and local governing bodies. During his career, he valued more than a billion dollars of utility properties of all kinds and made rate studies in a thousand cases.

Donald A. Henry

A native of Newton, Kansas, where he was born April 9, 1887, Mr. Henry received his B.S. in electrical engineering from the University of Illinois in 1909 and his professional degree of electrical engineer from the same school in 1919. He also studied law at Lincoln College of Law, Springfield, Ill.

Mr. Henry joined Utilities Power and Light Corp., Chicago, in 1927 as rate and valuation engineer and devoted six months to a study of depreciation, a 200-page brief of which was presented to the Department of Internal Revenue. In 1928 he became head of the rate department for the company now known as Consolidated Electric and Gas Co. where he had charge of rate and valuation matters for all subsidiaries—gas, electric, water, street railway and heat in 26 states, two Canadian provinces and six foreign countries.

When Stone and Webster took over the management of Consolidated subsidiaries in May 1933, he went into the Stone and Webster organization as rate and valuation engineer, the position he held at the time of his death.

A. T. BARRETT

Mr. A. T. Barrett, superintendent of American Meter Company's Chicago factory, died on July 19th.

Born in 1872, Mr. Barrett was identified with the gas industry since 1889 when he started work with the Maryland Meter Works. In 1913 he went west to Manage the LaPorte Meter Company, which was taken over by American Meter Company at that time. Later Mr. Barrett moved to the Chicago area as sales representative of American Meter Company. From 1942 until his death he was superintendent of that company's Chicago factory.

A. T. Barrett

An active member of the Mid-West Gas Association, Mr. Barrett was instrumental in starting the Ames Meter School, which was sponsored by that association. He was also a member of the Indiana, Illinois and Missouri associations and the A.G.A., as well as active in the Wisconsin Utility Association. He was a member of the Meter and Regulator Sub-committee of the latter at the time of his death.

GEORGE LIGHT

George Light, probably the oldest employee of any gas company in the United States, died at his cabin on Lang Lake, in Canada on July 27th. He was found dead in bed by his son and it is believed of a heart attack. Mr. Light was 86 years old. At the time of his death he was Gas Consultant and Director of The Dayton Power and Light Company in Dayton, Ohio. Had he lived until September 4 this year he would have rounded out 70 years of employment with this company, possibly a national employment record. George Light was well known in the Gas Industry. He began his associations with it in the old artificial gas days when he was 10 years old. His father, Joseph Light, was operating the company in Dayton at the time. Three sons of Joseph Light were associated with the business, the late George Light, Edward Light and Joseph Light Jr. The latter two have retired from the organization. A son, Robert H. Light, is gas engineer with the Company. For the past 25 years George Light spent a month out of each year at his lodge in the Canadian woods and death overtook him at this spot that he loved so well. His body was brought to Dayton for burial. It was during his associations with The Dayton Power and Light Co. and predecessor companies in Dayton that Mr. Light saw the rapid growth of first the artificial gas and later the natural gas business. He was most active in all progress made in the industry and during his more active days he was known throughout the country for his associations with the gas business.

CHARLES K. FOSTER

Charles K. Foster, Director of the American Radiator & Standard Sanitary Corporation and for more than fifty years prominently associated with the Heating Industry, died in New York on July 28, 1945.

Mr. Foster was born in Detroit, Michigan, October 19, 1867, and joined the American Radiator Company at its formation in 1892. He was successively Assistant Secretary, General Manager Sales, Vice President in Charge of Sales, Vice President and Treasurer and Executive Vice President. At the time of his retirement several years ago he was Vice President of the American Radiator & Standard Sanitary Corporation.

He was also a Director of the American Steel Foundries Co. and the First National Bank of Chicago.

Mr. Foster's home was in Chicago where he was a member of the Chicago Club and Old Elm Club.

WILLIAM B. duPONT

William B. duPont, manager of the Industrial Division of the National Radiator Company, Johnstown, Pa., died in the Mercy Hospital in that city on August 9 after a short illness. He was 31 years old.

Mr. duPont graduated from the Massachusetts Institute of Technology in 1936 and became associated wtih E. I. duPont de Nemours & Company at Richmond, Virginia. In 1939 he returned to M.I.T. and obtained his master's degree in chemical engineering. Since then he had been with the National Radiator Company.

Westermair Retires from Welsbach

F. Victor Westermair, for many years associated with the Welsbach Engineering and Management Corporation and Subsidiaries, Philadelphia, Pa., announced his retirement as of July 1, 1945 to engage in consulting practice to municipalities and utilities, at 400 King's Highway East, Haddonfield, N. J.

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City of Holyoke
Invitation for Proposals

The Gas and Electric Department of the City of Holyoke, Mass., invites sealed proposals for furnishing and installing

1. One 9′-0″ automatic carburetted water gas set.
2. One turbine driven blower and blast piping header designed to deliver 25,000 feet of air per minute.
3. One exhaust steam accumulator 8′ diameter x 25′ long and piping.

Foundations and operating floor to be furnished by the purchaser. Water gas set to be installed in available building space. Details upon request.

Proposals will be received until 4.00 P.M., Monday, October 1st, 1945, at the office of the Manager of said Gas & Electric Department, 70 Suffolk Street, Holyoke, Mass., at which place and time, proposals will be publicly opened and read.

Each proposal must be accompanied by a certified check for $500.00, and the successful bidder will be required to furnish a bond of some surety company satisfactory to the Department for the faithful performance of contract.

The right is hereby reserved to reject any or all proposals or to accept any proposal that in the opinion of the commissioners may be for the best interest of the City of Holyoke.

Gas & Electric Department
James L. Tighe,
Edward D. Hallisey,
Fairfield Whiting,
Commissioners.

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14 BROOKSIDE CIRCLE, BRONXVILLE 8, NEW YORK

FOR SALE

1—11′0″ x 10′6″ x 10′6″—3 shell, hot valve, UGI carburetted water gas set with back run connection.

1—Steel bldg. for 11′0″ water gas set.

1—Buffalo #85 gas fan, driven by 282 H.P. Terry Turbine.

1—No. 10 Sturtevant Fan—No prime mover.

2—Overhead steel purifiers on steel supports, each 24′ x 30′ x 13′—constructed as a unit.

1—Connersville Rotary gas meter 18″ x 54″.

1—8′ x 50′ Tower Scrubber.

For more detailed information write

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POSITION OPEN

DISTRIBUTION ENGINEER: This position offers a real postwar future with a progressive manufactured gas utility. Steadily increasing load has necessitated doubling our plant capacity. Our distribution system expansion requires a qualified engineer with experience in this field. Situated in the heart of the evergreen playground of the Northwest, at the gateway to Alaska and the Orient, this company has every reason to anticipate an extremely bright and prosperous future. Reply Seattle Gas Company, P. O. Box 1869, Seattle 11, Washington. Give full details of education, experience, salary expected and date available.

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Good opening with progressive Company for experienced development engineer, capable of refining present products and mechanizing any operations for manufacturing. Full charge of Department. Give all details first letter. Address Box 144, c/o American Gas Journal, Inc., 53 Park Place, New York City 7, N. Y.

Gasification of Coal

(Continued from page 20)

One system which suggests itself as applicable to high speed reactions between gases and solids is the gasification of pulverized fuel. With complete balancing of reaction heat by circulation of gas, or by using a simultaneous endothermic reaction, complete conversion by hydrogen might be achieved.

REFERENCES

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(5) Broadhead: *Trans. Inst. Gas Eng.*, 1936-37, 86, 774.
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"Big Inch" Pipeline Facts

Beginning its first week of peacetime operation and its third year of full-length operating, the "Big Inch" pipeline was credited by Petroleum Administrator Harold L. Ickes with an incalculable contribution to the defeat of the Axis powers and with a record of accruing operating revenues which exceed the cost of its construction.

The 1,254 mile, 24-inch line from Longview, Texas, to the Philadelphia-New York area, with its 224 miles of feeder and distribution lines, has delivered more than 210,000,000 barrels—8,820,000,000 gallons—of crude oil to its Eastern terminals for the defeat of the enemy and the maintenance of essential civilian activities since it first began full-length operation on August 14, 1943.

The pipeline delivered 114,261,589 barrels of crude oil during the last 12 months of its operation, establishing a daily average of 313,045 barrels.

Constructed at a cost of about $78,500,000, the "Big Inch" has a cumulative operating revenue of more than $113,000,000 from transporting crude oil, before deductions for depreciation, amortization of the investment, and interest on working capital.

Actual construction work on the "Big Inch" began August 3, 1942, at Little Rock, Ark. On December 31, 1942, the first oil was pumped into the pipeline at Longview, Texas. The stream reached Norris City, Ill., on February 13, 1943, and six days later the first tank car of crude oil was shipped eastward from the Norris City loading terminal.

The only serious interruption in the flow of oil through the 24-inch pipeline occurred on May 17, 1943, when floods of the Arkansas River caused a break in the line at Little Rock, Ark., operations were resumed after six days and 21 hours when an 8-mile emergency loop had been constructed around the break.

The "Big Inch" system has 50 storage tanks having a capacity of 3,867,500 barrels.

A total of 346,037 tons of steel was used in the construction of the pipeline and 20,400 tons in the construction of the storage tanks. The total tonnage, 366,437, is approximately equal to the amount of steel used in manufacturing 300,000 passenger automobiles.

The "Big Inch" was the longest pipeline in the United States until the completion of the Government owned 1475-mile 20-inch "Little Big Inch" products pipeline.

With the completion of the "Big Inch," "Little Big Inch" and other lines built during the war, it is estimated that the United States now has 85,076 miles of petroleum trunk lines and 56,714 miles of gathering lines or a total of 141,790 miles.

Canadian Activities

(Continued from page 47)

This business was established in Medicine Hat in 1905, shortly after natural gas started flowing through the distribution system in the city, at the rate of about five cents per thousand feet. It is quickly realized that this provided an ideal situation for the development of a greenhouse industry.

Largest of the plants in the Medicine Hat area is the Medicine Hat Greenhouses Limited, which have 9½ acres under glass, constituting the largest greenhouse area west of Brampton, Ontario.

The Canadian Greenhouses have three acres under glass, while Valleydale Greenhouses and Riverview Greenhouses have one acre each. The Dominion Greenhouses and Mills Greenhouses each have slightly under an acre under glass.

All greenhouses are heated by burning natural gas in low pressure steam boilers. The fuel is purchased from the city, as well as millions of gallons of water required monthly to bring flowers and vegetables along.

Heating greenhouses may be a major problem in other cities, but in Medicine Hat it is simple.

Take the case of Mr. Morris' plant, consisting of 71 greenhouses, each 25 feet wide and ranging in length from 150 to 275 feet. The entire property is heated by steam from six tubular boilers fired by natural gas. As temperatures drop outside, gas valves are opened up and a constant temperature can easily be maintained under the glass. There is no problem of feeding fires, regulating temperatures or disposing of ashes.

The gas bill for the Medicine Hat Greenhouses Limited ranges between $5,000 and $6,000 a year. If coal were used, explains Mr. Morris, the fuel bill would be at least four times as great, not to mention the additional labor required.

J. E. Diver Appointed to Caloric Stove Staff

The appointment of J. Emmet Diver as Chicago representative has been announced by Julius Klein, General Sales Director of Caloric Gas Stove Works, Philadelphia, Pa.

Mr. Diver comes to Caloric with twenty-five years of extensive sales and merchandising experience in the furniture and appliance field, having been associated formerly with the American Stove Company and the General Electric Supply Company of Chicago.

As representative for Caloric, Mr. Diver will cover Metropolitan Chicago and the northern part of Illinois where he is widely known to the trade.

New Book on Portland, Oregon

The Portland, Oregon, Chamber of Commerce has released a new book entitled, "Let's Look at Portland." This book is not a "promotion piece" in the usual sense of the term. It seeks only to give factual information such as would be required by any business man who wishes to survey the business possibilities of Portland. By means of photographs, maps and text supported by statistical data, the book answers questions on population, resources, water, fuel, gas and by-products, power, climate, transportation, labor, taxes, sites, and other facts about the Portland area. It is excellently printed on good paper, contains 48 pages and cover, 8½ x 11 inches, with plastic binding.

Copy available through Industries Department, Chamber of Commerce, Portland, Oregon.

Humphreys Joins ASHVE Staff

On September 1, Clark M. Humphreys came to the Research Laboratory of the American Society of Heating and Ventilating Engineers, Cleveland, Ohio, as Senior Engineer. He has an extensive background of training in the Mechanical engineering field and a wide experience in heating and ventilating design, as well as a fine record as a teacher and a writer on technical subjects.

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THE equivalent of 23,000 years of metallurgical and ceramics research was required to perfect SMITHway *Permaglas* for water heater tanks. Just "any glass lining" won't do! There is no way to by-pass the time, patience, scientific knowledge and facilities required to develop the ceramics formulae and the metallurgical processes that have made *Permaglas* possible.

Resistance to thousands of water specimens, and a multiplicity of other time-consuming tests starting way back in 1929, continued for eleven long years before we were ready to offer *Permaglas* to the public.

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Write for "The Inside Story of *Permaglas*" . . . a great aid to sales.

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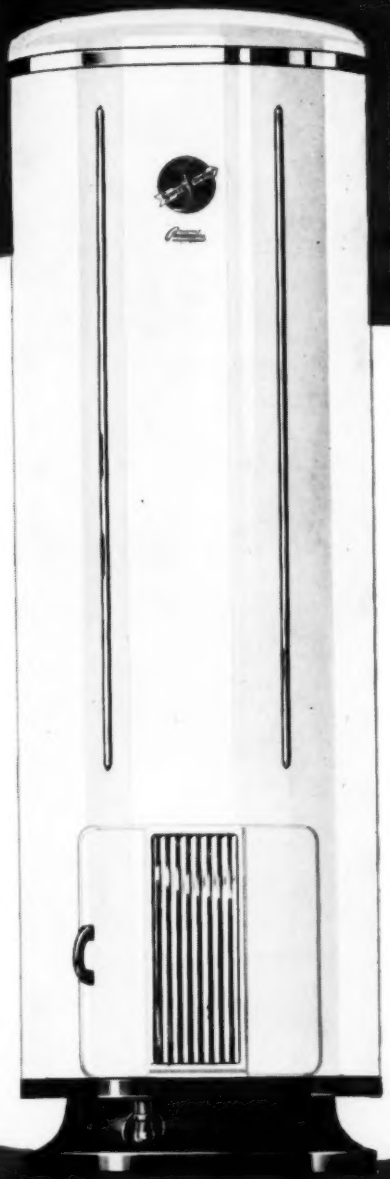

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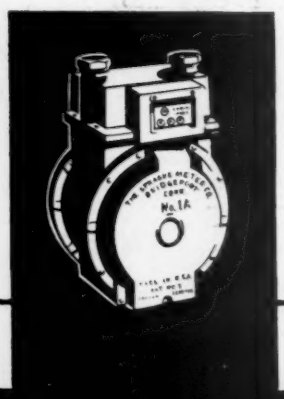
NO SUBSTITUTES! During the War no substitute materials were used in any part of the meter. This means that standard parts have been used throughout the War and will continue to be used in Spragues.

APPRECIATION! Your cooperation and patience has been greatly appreciated. We have done the best we possibly could, and it will be a pleasure to continue to serve you to the fullest extent of our ability.

F. C. Fairchild.

President and General Manager



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